CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE AGENTS

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CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE AGENTS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
Washington, D.C., Tuesday, June 16, 1959.

The committee met, pursuant to notice, at 10 a.m., in room B–214, New House Office Building, Hon. Overton Brooks (chairman), presiding.

The CHAIRMAN. The committee will come to order.

We have one witness this morning. General Creasy, who has been in charge of chemical warfare. He is a writer of note, and very prominent and very active and has a very real reputation in the field we are going to cover this morning.

General, for the reporter's sake, would you give him your full name and your official title so that the record will disclose that.

General CREASY. Mr. Chairman, I retired from the Army on the 31st of August last year. At that time I was Chief Chemical Officer of the Army. My full name is William M. Creasy.

At this time I work for the Lummus Co., who are engineers and constructors for the petroleum and heavy engineering industry. My particular assignment with them is director of their engineering development center. As I explained to the counsel of committee when he called me some 2 or 3 weeks back, I thought it might have been wiser for you to have had as a witness in this area, General Stubbs, who is the current Chief Chemical Officer, and who, I assure you, is very eminently qualified for the position and in the 10 months he has had it, as far as I can tell from my nonsecurity position, has made some remarkable progress.

I also want to caution you, being out of the Army, while I have a certain amount of freedom, in that I am not bound by some of the protocols and shibboleths that must be borne by the active military officer, my position vis-a-vis security might be possibly even a little more tenuous. When you retire you lose your security clearances, you lose your contact with the day-by-day progress and the long-range program. You are also prone to get a little vague in your mind just what the security lines are and since the penalties for overstepping these lines are very severe, including such things as losing all your retired pay and a few other things, one is prone to be very careful. I think, however, for the purposes of the committee hearing I will probably not have to hide behind the security barrier too often and if I do I am quite sure our military active duty people who are available to you can pull that curtain aside and be most happy to do it.

The CHAIRMAN. If we get in that situation the committee can always go into executive session. I will promise you this. You will

suffer no loss from your retirement pay by telling us what you do in executive session.

General CREASY. This does not scare me. But I really wanted to make the point, Mr. Chairman, that there has been, I am sure, considerable progress in all these areas that I clearly could not be in touch with, without the security clearances. I do have security clearances in my industrial position but as you know these things are disclosed upon a need-to-know basis and no longer do I really have the need to know about the progress in the various chemical and biological fields cited.

The CHAIRMAN. Do you have a prepared statement, General?

General CREASY. I do not. Not knowing exactly what grounds you wanted to cover, I have made a listing of some 15 to 16 topic sentences. I can cover these in a period from 10 minutes to 2 hours or any other period of time that you would like to shoot at or I can sit back and let you ask specific questions. But if you would define whether you are primarily interested in the field of psychochemicals at this time or the broader field of chemical and biological warfare, it would be helpful to me.

The CHAIRMAN. It would be helpful to hear both. You were requested as a witness for the committee on the basis of the article on psychochemicals which you wrote and which I read. It seems to me most pertinent to the work of this committee, for you to proceed on the subject matter of that article first.

General CREASY. Fine.

STATEMENT OF MAJ. GEN. WILLIAM M. CREASY, USA (RETIRED) FORMER CHIEF CHEMICAL OFFICER, U.S. ARMY

General CREASY. As you gentlemen will recall, the particular article was an interview given to the representative of This Week magazine, a Mr. Charles Rice. Mr. Rice was primarily interested at that time in the psychochemical area. We discussed a number of other things, but the article was narrowed down to that area. I want to say in passing I do not want to steal any of the thunder from the current Chemical Corps, but I want to recall the first thing that brought it to the public notice was the picture of the cat and mouse, brought out about 6 months ago. I am happy to report the cat in the picture, "Speedy", is now a mother.

So not only do psychochemicals not kill, but they do not stop some of the ordinary processes of life.

The CHAIRMAN. Refresh us and bring some of the committee up to date on that.

General CREASY. Yes. Let me back up a little, if I may.

The psychochemicals agents are one of the newer series of agents which are being worked upon by the Chemical Corps of the U.S. Army on behalf of the Department of Defense that fall in the general chemical-biological field.

As such, one is not really sure just how they are affected by national policies in this area.

I am sure that you gentlemen are aware that the stated national policy of the United States is that we will not use chemical or biological warfare except in retaliation. The legal status roughly is that

the United States, while they did sign the Hague protocol, a number of years back, did not ratify it.

England did ratify it.

Russia, however, in ratifying it, made it quite clear that their ratification was not binding against any country which in turn had not ratified it or the allies of any such country, so for practical purposes there is no legal barrier to the use of any of these materials.

Practically, however, when you state that something will only be used when somebody else uses it, it puts a military planner in a kind of never-never world.

Clearly, the military man bowed down by the logistical problems of fighting in the field, is not about to carry anything with him that he is not sure he can use. Nor is he about to spend any significant portion of his development funds or his logistical funds in preparing for this type of war. This could, of course, lead to a very horrible situation if these things are used against us.

I think I could sum up my own feelings on it by saying this is probably a crime against the American soldier and one that this country may well live to regret. I think it is safe to say that our programs are not being prosecuted, dollarwise, or with the motivation that they would be prosecuted, if we had a clearly stated policy that put them in exactly the same category that we put the atomic bomb and all other things, and in essence if we said we will use these things as we very well see fit, when we think it is in the best interests of the United States and their allies. Then, and then only, will you have a situation when you would bring men, money, and motivation to bear properly on the problem.

In the field of psychochemicals, I think I stated to the Appropriations Committee last year that on the assumption that the amount of money expended in these fields was multiplied tenfold there could be no positive assurance that you would have them ready for large-scale field use in a period of 5 to 10 years.

I think it is quite clear here then that I do not believe too much has happened to correct that situation, since my appearance before the Appropriations Committee last year.

It is true, however, that a significant amount of work has been done by the Chemical Corps on a limited range of psychochemicals, and the word itself is somewhat of a misnomer, because some of them would not apply to the first part of the double word and some would not even apply to the second part.

The psychochemical is broadly one which attacks the various sensory, perception or nerve centers of the body doing what I have called discombobulating them. They make you act in a different manner from that in which you would normally act. Your hearing might be affected, your sight might be affected, your physical balance might be affected; and in the case of the one that was used in the cat and mouse series of pictures, the actual approach to all problems were affected. Let me describe that series of tests, if I may. The chemicals used in these tests were some in the general lysergic acid series well known to medical and chemical people for many, many years. This is nothing new that was dug out of anybody's Pandora's box by the Chemical Corps. They merely took something they could do with a little money to test and see what effect it would have on test subjects.

This particular material could be utilized either as a gas, or as a liquid. It could be put in coffee. It could be boiled without affecting its potency. It could be treated with chlorine—I think the requirements to knock out 1 mole of this material is something like 10 to 1, which means if it were put in sufficient quantity in a water supply such as this [holding up pitcher] for your committee or even put in before the treatment of the city water, its potency would not be changed at all.

In this particular series then, the photographs which were shown rather widely on television, and small pictures that were shown in some of the newspapers were actual photographs of an actual test. They were not staged. They were part of an investigation program.

First a cat was put into a cage with a mouse. Well, a cage is a little strange environment for a cat. After the cat got accustomed to its environment it did just what you think a cat would do with the mouse. It ended up with the mouse in its mouth shaking it very violently. One presumes the mouse died. Actually I am not sure of this. Then a miniscule amount of material was injected into the cat in this case, something significantly less than is shown when the point of a ballpoint pen is poked up. Then some 10 minutes elapsed for the material to take effect. The cat was put back in the cage with another mouse. Those who are familiar with the film clips saw what happened. It appeared the cat was chasing the mouse around the cage. That was not true. The cat was trying to get away from the mouse. It was running around the cage in the reverse direction. It gave the impression of the mouse chasing the cat, completely changing the normal behavior pattern of the cat, not the mouse.

To a degree, within the rather severe protocols that are necessarily applied to the military in any of their experimental work, these and similar things have been tested upon volunteers. I personally object to the phrase human volunteers, because I don't know personally any other animal than a human that can volunteer. These effects upon the human are substantially the same as those demonstrated on the cat.

This is, of course, part of the statements made in this interview—if we did this to the Congress we could possibly have you dancing on the desks, or shouting Communist speeches.

This is no figment of the imagination, but let us bring this down to something really practical from a Russian propaganda viewpoint and let us make it really practical from a military viewpoint. Bear in mind these things could be used as gases. Bear in mind I said it would be a long time before they would be ready for large field use. But also like any other chemical, these are available. The quantities you use and the mechanism by which you use them for these particular ones would be limited solely by man's imagination and the number of dollars you wanted to put in the program. Let's say the Russians wanted to go to the Cow Palace, or wherever you gentlemen hold your political campaigns next year. Let us say we put it in a dispenser, or on a laundry truck and drove around the building and then you put the event on television. Some might say you would not notice the peculiar actions of individuals at a political convention. Personally I think they would be multiplied manyfold. But let us get really practical. For some reason let us suppose there is going to be a heavy missile or bomber attack on the United States. Let

us bear in mind one of the shortcomings if you will. In the present stage of development these things affect the human body for only 24 hours and after that the individual is perfectly normal again. Would it not be rather simple, with say 35 or 40 such trucks, to circle, at the appropriate time, all of our NIKE defense bases in this country? These are all relatively small compounds. All you do is run around the things with a little red wagon if you want to because the soldier can't go outside the perimeter of his space to defend it. If you want to do the same things at the Air Force stations, you simply have a few more trucks and a little more area to cover and I am sure you could do this without going on the base and I am equally sure if our probable opponents wanted to get on the base they could probably get on; in fact I am positive they could get on, and I am quite positive you could do this same kind of thing in the Pentagon. You do this at the critical time of your 12 to 24 hour period. Then you have the Maginot Line or the Bomarc or whatever it is you rely on at the present time completely useless. And I did not say Bomarc because I happen to be an Army man, but just by way of illustration.

One might assume that a vigorously pursued program of tests have tested some of these things. I do know that once during my own time, when I was attempting to put on, with a good cover story, a test to see what would happen in subways, for example, when a cloud was laid down over a city, that this was finally denied. It was denied on reasons that always seemed a little absurd to me, that it might give some information.

My question is, who in creation are we giving information to? We have every reason to believe that the Russians in most of these areas are equally competent technically. We know that they do not have the protocol restrictions about testing on volunteers. In fact, we have reason to believe that they don't even bother about getting volunteers. We must assume then that most everything that we know they know. So in the final analysis in most of these instances we are denying information to only one group of people and that is the American public. And they are the people who by and large determine what you gentlemen want to do with your dollars when you sit in your appropriate committees. They are the people who largely give you the guidance that determines what you will do in your Science and Astronautics Committee.

I feel that we must have all barriers removed on the "what to do," and give it to the people.

I feel equally strongly that if one accepts as a major function of the military or the Defense Establishment that of setting up a deterrent picture throughout the world, something to prevent war—and I honestly believe 90 percent of all we do in the military is for this purpose—then we completely abort the entire program, unless we keep our own people informed; as well as keeping the Russians informed.

You do not deter small boys from going into swimming pools by putting up a notice four blocks away. You deter them by putting a cop on the corner that keeps them out. You don't deter people from speeding on the highway by putting unmarked vehicles out. You may punish them but you only deter by putting out marked vehicles. And the only deterrent value is if we announce to the Russians, yes, we do have things; this is what they do, and we do propose to use them.

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Now, as to whether you talk glibly about a lysergic acid, here I think I would take an entirely different picture. Our detection devices, and to a degree our protection devices must be triggered, must be so geared that they will be triggered by a particular chemical molecule, or a particular electrical impulse, or a piece of microorganism of a certain size.

So if Russia then comes up with one that has a different technical formula, it probably will not respond to our detection devices, so we might be living in a false paradise if we think we have detection devices and quite clearly we make it easier to the Russians if we tell them what our own formulas are. So I prefer not to talk about this. I only talk about those which have already been talked about in the past. There again, why hide something that already has been laid out on the table.

I could speak also to the general subject. I pointed out no one knows whether these things are held under the national policy that applies to chemical warfare as such. I do not think this is a problem that we have faced up to very squarely.

I have been asked whether or not the United States should be at this time gearing up to protect themselves defensively against this type of attack.

I have felt that the problem of an organization such as the Chemical Corps is not to state whether or not there is going to be a war, and you don't gear up for defense, civil defense, national defense, unless you really think there is going to be one, or unless this is part of your deterrent program. However, it is certainly true if we don't gear up to protect against a broad range of chemical and biological agents, we are inviting use of just this type of attack.

Whether they would be the psychochemicals or the more deadly biological or chemical agents is not the point for the minute. The real point is that practically all of these things are heavier than air.

Therefore, if we go around gearing up our civil defense with underground shelters, to protect against the atomic bomb, and instead of having the atomic bomb, when the guided missile comes over, it has a chemical or biological warhead, instead of saving people you are guaranteeing sure death or sure sickness or whatever effect the particular warhead is designed to produce. As you go underground, you must have ventilation, and as you put in ventilating fans and as you put in air-conditioners, you simply guarantee, instead of the agent wafting as the wind wants to waft it, it will go down that particular intake you have conveniently arranged and hit your citizens. If you go further and look at the immediate capabilities, we delivered mail recently with a guided missile. We needed an airplane to take it in, but I have every confidence in time someone will tie in the Regulus or other missile so it will come in without this guidance. Let us take this huge fleet of Russian submarines—and I won't give the number, because (*a*) I am not sure what the number is and (*b*) because I am sure the Russians do—put a number of them off the coast 100 or 200 miles out and have them put this material out either as a cloud or with a guided missile which can be thrown into our population centers. In the first place one must assume they really do not want to bomb all the docks in New York. They do not really want to destroy the Pittsburgh steel mills. There is no percentage in it. They are very realistic people. They would

want to come to this country primarily to capture our industrial resources and perhaps keep you boys and me as slave labor to work in them. So they will hit relatively few bases. They will knock out Strategic Air Command bases if they can, unless they can put them out with psychochemicals. But by and large they are not going to knock out our industrial might or kill our people. Note also that the Russians have announced that at the outset of the next war—this is public information—that they have every intention of starting with both atomic and chemical warfare. This is stale news. This is news some 3 or 4 years old.

In any event, if you will assume they do not want to destroy buildings and that they merely want to capture and to occupy, do they not now have the capability?

Such limited civil defense measures as we have taken in this country, such as planning to evacuate New York City or Washington, are abortive. You have not, of course, a chance of doing it. You could not do it in 2 days or 2 weeks, much less in the time available from when you get your notice. And if you did evacuate them, where possibly would they go? So let us assume the Russians would go out and put out their guided missiles off the submarines, and let us hope you shot down the best percentage you hope to shoot down, you are still going to have enough so that all the people in your shelters will be affected. Whether it will be enough to allow them to come ashore, I don't know. Do the Russians plan to do this? Again, I don't know. But it certainly is within their capabilities at this time.

What is the measure of the effectiveness of these agents? Here I will have to fall back in time to be really quantitative and give you something you can put your teeth in: Iwo Jima was defended by some 21,000 Japanese. In taking Iwo Jima we had some 25,000 casualties. I do not have these numbers reversed. Of these casualties, there were some 7,000 deaths, American deaths. At that time, there was available to the military commander chemical agents which he had the logistical capability of using, against which the Japanese forces had no protection. Their mask at that time did not protect against these chemicals. He was denied, by the then existing policy, the use of these materials, presumably, on a humanitarian basis. Presumably this was not the thing for Americans to do.

Let us see what the net result of all this humanitarian fervor of ours was, other than the 7,000 dead marines, and the other 18,000 casualties. What happened to the 21,000 Japanese? Most were killed, most by white phosphorus and flame throwers. We did our job all right. It did not put us out of operation. But I am "agin" it and I think the most effective and humane way is by chemical and biological and radiological weapons, and I think in the future, provided sufficient impetus is put behind it, I think the future lies in the psychochemicals. Just where the Russians stand, frankly, I don't know, and frankly if I did know, I would not talk about it at this point.

I think that may be enough, Mr. Chairman, to lay some groundwork so I can be responsive to particular questions that members of the committee might like to ask.

As I say, I have deliberately covered, except for small incursions, only minor parts of the psychochemical field. I have not attempted to cover other than in broad policy the chemical warfare and biological warfare policy at all.

The CHAIRMAN. General, we thank you very much. What are the technical names or do you want to give us the technical names of these materials that you have referred to—these psychochemical materials?

General CREASY. Mr. Chairman, the only ones I have mentioned are the derivatives of the lysergic acid. I see sitting in the back of the room over there Colonel Willman of the Chemical Corps, one of the right-hand men of Dr. Frolich, and Dr. Frolich is General Stubbs' right-hand man in this area. I would rather toss that ball to the back of the room and ask Colonel Willman to give you this at a later time for the record.

I think I can say, without embarrassing the Chemical Corps, that they would probably be delighted to do this, within limits.

The CHAIRMAN. Well, we can call General Stubbs later on for that purpose. Let me then ask you this: Can you develop for the committee the appropriate roles in modern war of nuclear explosives, and chemical, biological and radiological weapons?

General CREASY. Well, this is a——

The CHAIRMAN. That is a big one.

General CREASY. Yes; it is probably worth the price of a good lunch anyhow, but I will take a crack at it.

I don't think any individual informed in military matters is going to attempt ever to play down the horrible destructiveness and effectiveness of the atomic and nuclear weapons. Nor do I think that they are going to belittle the strong probability that they will be used in a major war.

But I think that most of us have long since become rather realistic, and have appreciated that the tactic of the Russian is designed not to permit a large war to start until he is reasonably positive that he can win it.

We have had in the last 4 or 5 years—and I don't have this figure positive, but I know it is 14 and I think it is 28, wars of some type, since the time the United States has announced that it would use the nuclear weapon. We have not used it in any of these.

Incidentally, we have not won any of them. It may be interesting to note that. We might have tied a couple, but we certainly have not won any.

One might deduce from this end that since human patterns don't change very rapidly, it may be some time before the nuclear weapon will be used. That is not to say we didn't need them. I don't think there is any question if we had not had the Strategic Air Command, with its overwhelming "kill" force we might well have been in war 2 to 6 years ago. But if we are ever forced to make a decision which requires us to put all our eggs in that basket, we will most certainly lose the next war, unless we control the manner in which it is fought—as well as the timing of its start.

I don't care whether you are a prizefighter, a football player or a soldier—you win or lose based almost entirely on how you gear your offensive against the position, quantity and type of a defensive mechanism set up by the enemy. If we ever rely exclusively on these things, we can be sure that is not how we will be hit.

But we cannot get along without them. We have not used them. I expect there will be a great deal of reluctance to use even the tactical weapons which are now available in many places throughout the world, as I understand it, to the American forces.

I think that the study would indicate quite clearly that the incremental cost of giving chemical and biological warheads to either your bombs or your missiles would probably not exceed 5 percent of the cost of the atomic system.

Now, bear in mind, I said incremental cost. The huge cost of any type of warfare is the cost of delivery—not the cost of the item that you drop, not the cost of the item that gets into the system, whether it be a piece of lead, a piece of uranium or a death ray. To digress for a minute I think the strategic bombing survey showed that in World War II the cost of demolishing a square mile of enemy territory ran between $10 million and $35 million, according to how you calculated—a pretty good refinement, incidentally. But no matter how you figured it, the total cost of munitions was not higher than $200,000 to $300,000. An insignificant part of the total cost, and it is this part that we would have to put on the atomic delivery system if we wanted to use the chemical munition. And incidentally, you would not have to use the system you have now, because the area you can cover by biological or chemical agents is so fantastically greater than that you can cover with an atomic weapon that you do not require the accuracy. So I foresee a requirement for these things to be in both our tactical and strategic stockpile. But so help me, I do not believe they will ever be there in meaningful quantities until we have a national policy stated to the world that we will use them as we see fit. I think it is criminal not to have it. But if I said that a year and a half ago in open court, I would probably have lost my teeth. I may lose them now but I have used them for a long time.

The CHAIRMAN. That would be akin to the resolution I think Mr. McCormack has introduced, to set a definite policy in the Far East, which resolution, if passed by Congress, would tell the Communists if they did certain things there would be a war and that is all, and therefore you stop the war. That is on the order which you have in mind, is it not?

General CREASY. You must draw a line, you must draw a clearly defined line. You may, if you wish, retreat from this line at some time in the future, because any line you draw today is going to be drawn in the light of today's circumstances. Two weeks from now, two months from now, whenever the curtain goes up, you may still not want to do it. I think you may remember the story about the little boy with the little red wagon. I told this when I was first made Chief Chemical Officer. Throughout the years, there had been a lot of things I did not like in the Chemical Corps, just as a lot of things I might not like have been done in this country. The little boy hauled his little girl around the corner on his red wagon and said, "Do you or don't you?" She said, "No," and he said, "Get out and walk." Finally, another little girl said, "Yes," and he said, "Great heavens, what do I do now?" The point here is, we can draw this line, and when we probably get up to it we will probably back out but we may never get the opportunity to control the decision unless we initially establish a position. We must draw some such line. Expenditures are getting fantastic. We just can't continue to live with them. I think any of you gentlemen are probably getting from two to six times as much money as you got 20 years ago. I doubt if any of you are living as well as you lived 20 years ago. I bet that every wife of every man in this room is working harder keeping her house personally

than she did at that time. This is taxes, largely, and the bulk of it is going to the defense organization and it is mounting and mounting. This is the Russian technique. They push here and there, so we build up a defense. As soon as we get our defense built up, they change their program. There is a big cutback in guided missiles which was announced the other day. This does not mean the Defense Department was wrong going into those programs; whether it is right now to go out of them I don't know. But it does mean we have given someone else the responsibility by saying (a) we won't fight unless you fight, old boy, and (b) we will be very decent about this thing, we won't use anything you won't use. Can we expect them to use the weapons which it would be to our best advantage to use? I don't really think so.

The CHAIRMAN. What efforts have the Russians made in this respect to date?

General CREASY. Mr. Chairman, this is one that gets awfully close to the security area, I am certain. I think I can probably answer it qualitatively by stating that I do not think there is any doubt that Russia has, within an order of magnitude, everything we have in the chemical warfare field.

They captured great quantities of material and took back with them quite a number of scientists in this area at the end of World War II. Here again I am speaking about those things which have been publicly announced. And, incidentally, I will repeat again that they have announced they do propose to use them.

In the biological field the picture is not as clear but here again it is clear enough to satisfy me that they do have a strong offensive capability.

In the psychochemical area, here I just don't know. I will say this, though: If they don't have it, it is because they don't want it. They certainly have the capability of having it.

The CHAIRMAN. Mr. McCormack wants to ask you this: What is our position?

General CREASY. Mr. McCormack, going back to my earlier remarks on security, if I can answer that qualitatively, I will try to. I do not think, however, that it would be wise for me to announce in public a too definitive quantitative answer.

I will say that prototypewise, in the CW area—I will make this a blanket statement, in the BW and CW area, excluding psychochemicals—prototypewise we have effective agent and munitions systems.

Defensewise, prototype, we have individual protective equipment that is very good. You never, of course, can really get an individual protective mask that anybody loves to wear, but the modern American mask is one in which you could play 18 holes of golf and not be too miserable. You would have the advantage if a gas attack came over while you were playing, you would have the advantage of being alive, which you would not otherwise.

Prototypewise, in collective protection, it is not too bad. I am sure we are all aware that there are certain key installations that are protected. You do this largely with mechanical equipment. Now, if somebody mixes a few high explosives in with a gas attack and puts your power system out, the man who is ensconced in a nice little subterranean shelter with a piece of nice electrical equipment running may get caught short and find he does not have his protection.

We also have a nonmechanical wallboard material which filters out both chemical and biological agents. You could use it, for example, in the windows of a room like this, a normal room, with normal outside wall windows, if you fill about two-thirds of them with this wallboard type of material, and you could replace them just like you do a window screen. You would get adequate protection in this room. You would be miserable after you had been there 2 or 3 hours, but you would be alive, of which some people seem to think very highly.

As for overall detection systems, prototypewise again, such things are available in the chemical warfare field. Biological warfare field is, of course, somewhat different. In chemical warfare you have gases now that you can neither see, taste nor smell so you have to hit them either by electronic measurement devices or by chemical reactions, but when you get into the biological field, this is something else. You are dealing with small animate particles. Biological warfare I am sure you know is the intentional use of microorganisms or similar products to make sick, ill or kill men, their domestic animals or their crops. Many of you men have been to the hospital and had to wait 3 or 4 days before the doctor could tell you what disease you had or your wife had, and then only after making blood and other tests. If you try to do this in the field you really have yourself a problem. However, they are unavailable here, although there are certain general prototypes for the detection devices that would give an alarm. After all, your major protection is going to come from putting on your mask and getting in your collective shelter. So for the moment the man being attacked does not really care what disease he is being attacked by. He just wants to keep it out of his system. But the doctor who is going to treat him—and I use this figure carefully—millions of other people, if he is going to do anything, he has to know exactly what to do—and fast. I want to repeat we are talking now about detection devices that protect against these things we have and the things we know the Russians have. One hopes they do detect and protect against whatever the Russians actually have. We don't really know that, however.

Now, for your psychochemicals, there is not too much to talk about in public, I think, at the moment, but it must be clear that generally the problem is about the same.

By and large, I am not worried about an attack from normal chemical agents, or BW agents by this process [holds up pitcher]—water. Psychochemicals, yes. A different order of quantities, a different order of magnitude and a different order of reaction, because we would be hitting at a smaller target. I don't know whether that gives you what you want or not, Mr. McCormack. If I have painted a bright picture, I did not mean to.

Mr. McCormack. What about our capability? You say we have certain capabilities. Could we put it into operation?

General Creasy. Mr. McCormack, I do not believe I would like to answer that question in an open hearing.

Mr. McCormack. All right.

General Creasy. Actually, I do feel that that question might better be directed at the active duty people. Bear in mind, I have been out of touch for 8 months. Things may have changed. I can give you a "No" answer and find out that the answer was really

"Yes" or I could give you a "Yes" answer and come in and find out someone had change policy.

I think I can safely state that many of the key people in the significant responsible positions, at least in the Army, today, military and civilian, feel substantially as I do on the importance of these weapons systems.

I do not honestly believe that my enthusiasm, if you will, or my evaluation, would be completely supported by some of my friends in the Air Force. I think it is only fair to be sure that that point is made clear.

The final evaluation of all these things has to come out of the triservice level, in the area of the Secretary of Defense.

But by and large, those people who are best informed are mainly located within a relatively small unit—the Chemical Corps of the U.S. Army, a unit that has a budget miniscule, compared to many of the other budgets. I expect their total research and development budget for chemical, radiological, and biological warfare, including their field tests and money they get from other agencies will probably not run above $45 or $50 million. This is a lot of money, but not to be compared with the terrific amounts going into other areas, areas that, important as they may be, could well be put completely out of operation by these relatively inexpensive methods.

The CHAIRMAN. Do you feel because you are in the know on this program, do you believe it does have the possibilities of being put into active use, either by us, or against us?

General CREASY. Well, let me say, at worst you would get a divided vote, in favor of doing these things.

Whether they will actually be used depends upon many, many factors. I have been asked many, many times, why did we not use these things in World War II and why the Germans didn't.

It is a publicly known fact that the Germans did have the nerve gases, they had issued the orders to use them in Normandy, on D-Day. At that time we had only a vague inkling that such things existed. We did not have any protection against them, our mask would have been completely useless; and had they been used, it is my personal judgment we would never have gotten ashore. They were not used because by some mischance or meddling with Hitler's intelligence people he was informed we were in a position of retaliating overwhelmingly. Of course, we were not. We could have retaliated with a huge amount of mustard gases, which required to do the same job, would be in the order of 75 to 1. Seventy-five tons of mustard gas would do the work of 1 ton of nerve gas.

The CHAIRMAN. What type of gas were they going to use?

General CREASY. A nerve gas. A GA.

The CHAIRMAN. What type of nerve gas?

General CREASY. If you get about this much of it and protective action is not taken in one-half to 2 minutes you will be dead in 10 minutes. I was pointing out here what amount appears here on the point of a ballpoint pen. This would cause death in 10 or 15 minutes at the most.

The CHAIRMAN. You mean one dot of this would cause death in how long?

General CREASY. Ten to fifteen minutes. If you got proper protective treatment in a half minute, maybe as much as 2 or 3 minutes, you might save a percentage of the people.

The CHAIRMAN. Did the Germans have it?
General CREASY. Yes, they did.
The CHAIRMAN. Did we have it?
General CREASY. We did not have it.
The CHAIRMAN. You won't say whether we do now.
General CREASY. Oh, yes, we have this now.
The CHAIRMAN. In quantities?
General CREASY. I don't like to use that word without an adjective in front of it, and I would prefer not to use adjectives in open hearing, but we do have it in quantities, and we have a plant at Rocky Mount Arsenal that can make the material. The plant is not now in operation.
The CHAIRMAN. Mr. Anfuso.
Mr. ANFUSO. General, you spoke of the possibility of enemy attack by submarines, creating a cloud which would spread poison throughout the whole hemisphere, or at least a portion of the country. If that happens that means you would have to supply not only our forces but every living person with a mask or some kind of protection, would you not?
General CREASY. To repeat the question, to be sure that I have it correct, it had to do with my earlier statement that submarines off the shore could either come in with guided missiles or could put up clouds which would float over the landscape. There is no question these things can be done. Quantitatively how far the cloud will go—quantitatively, if there is a chemical cloud, how much it will have been diluted before it gets to a particular target area, is another problem. With the biological agent, quantitatively—remember this is a particle now, with a certain amount of fallout and a live organism and a certain amount of death—we have to ascertain what precise concentration you have to have at the appointed target to be effective. The farther you are offshore the more ground you have to cover.
But you asked what are you going to do with people and the answer is, as you said, those people in an area that gets a lethal concentration or casualty producing concentration who are not either in a protective shelter or with an individual mask, to use the expression I am sure you will all understand, will "have had it"; there is no question about it. Now, there are available prototypes of a relatively inexpensive civilian protective mask, and I say relatively inexpensive and I won't be too far wrong on this; I would say in the order of $2.50 or $3 at most, or as low as a dollar, and the military prototype of that mask would cost you, say $15 to $25, according to the materials and the amount of time in making it. The civilian mask will protect an individual roughly, say, at least half the time that the military mask protects you, protects you completely under the proper environmental conditions. If you gave the mask to a soldier who had to go through barbed wire, or through mud or through the rain or set up a guided missile, it would be no good to him. But these prototypes are available. Whether or not they should be purchased and given to the people has to do with whether or not there is going to be a war and with civil defense funds and other things. But let there be no question about it, if the cloud comes over and gets in the nostrils you suffer whatever effect the thing is designed to produce.
Mr. ANFUSO. You are not advocating right now that civilians be supplied with masks, are you?

General CREASY. I am keeping my dirty hands off this problem. I will say this, the Chemical Corps has set up and I assume they possibly have it in a better form now, direct liaison with the Federal Civil Defense Agency and by and large the Chemical Corps turns over to them all knowledge they have, classified and unclassified, on equipment devices, offensive procedures, protective measures, and whatnot, and when in the judgment of the civil defense people something is classified that they think should be unclassified, normally if we can agree with them, we support them in their efforts to unclassify it. So they carry the responsibility, if you will, to make the determination what the public should have. I do not think this is an area the Chemical Corps should get in normally. I think this is normally a thing the military man must keep his hands off. He must supply the information. But the decision is like the decision to buy these masks and give them to the people. I will say this. If you ever furnish them to the American public, I hope you charge them something for them. I don't care whether it is a nickel, dime or quarter, but the American man, woman or child, if you give him anything for free, he throws it away. If you charge him for it, he will nurse it. I am speaking about the original issue, if you will. Obviously, when the time comes when you think they will really be needed, then you are not charging for things.

Mr. MCCORMACK. Won't it be rather late then?

General CREASY. Mr. McCormack, it would not be the first time in American history when we had been too late.

Mr. MCCORMACK. I know, but previous experience of American history gives us more time to prepare.

General CREASY. Yes. It is true you are going to need time to have stockpiles prepared, and get these stockpiles into the area where they could be delivered to people. I know the civil defense people have made studies, just like the atomic people have, about the critical target areas. As I recall, to go back to your specific number, some years ago there was a study made, how many people do we have in this country now—close to 180 million people—as I recall in critical areas the numbers involved were something like 60 or 70 million and this was the number that you might well——

Mr. ANFUSO. Bear in mind.

General CREASY. But the man in the Connecticut area would be in danger if the cloud came over, he would be in business too. So you have to increase your critical shore area. Who said this must come from a submarine? This could come from a guided missile that could come out from a line source, at whatever altitude you wanted him to go.

Mr. ANFUSO. Let me ask you this, General: If there was a surprise attack, a concerted attack, that would probably last, to be effective, for a long time. Would a mask be of sufficient protection? In other words, would not the atmosphere be contaminated for a long time?

General CREASY. I am glad you raised that point.

By and large, these things being aerosols, move with the air. After a rain storm, when you smell the fresh, clear air, this is not because the rain has washed all of the dust out of the atmosphere, it is because you are getting fresh air moved in behind the rain storm, so your chemical cloud or biological cloud similarly will move out to some other major area.

So unless there is a line source continuously putting up the material or laying it down, as the case might be, normally in a couple of hours, except in pockets, all of your stuff will be gone.

There are gases, where if you put them down as liquids, the gas will be persistent for a long period of time. This is the old mustard gas and all kinds of things can be done with the newer. So you might here get a longer period of contamination. But by and large I think it is safe to say the vapor after contamination will be not more than say 5 percent of the hazard you had while the major attack was on.

Mr. ANFUSO. Unless there was a repeated attack.

General CREASY. That is right. In your military setup, one can visualize if you get chemical or biological warfare in use, the soldier will live in his mask a very long time. This is not a matter of 10 or 15 minutes.

The CHAIRMAN. I would like to recognize Mr. McCormack now, since he suggested General Creasy, and has to leave in 10 or 15 minutes.

Mr. ANFUSO. By all means.

Mr. MCCORMACK. I take it you do not agree with the general policy of ours that we will not act until after we are attacked.

General CREASY. Mr. McCormack, I would be the last one to recommend a preventive war. I think you will find that by and large the man who has spent a significant portion of his life in uniform is the last one to want war on any basis.

But I think it is an untenable position to attempt to occupy in the world today to say that we will not strike back until somebody hits us. I think blows today can be delivered that are so devastatingly effective, whether we are talking about the atomic bomb or some of these other things, that you may never have the opportunity to strike back.

I think there must be a line drawn and you say, when you step over this line, you have had it. I am willing to agree as I said earlier, you may retreat from that line or under another set of circumstances draw it in a different place. But when has the war started? Certainly you cannot say the war just started when a bomb was dropped on Philadelphia or New York City. It started prior to that when it was launched, or prior to that when somebody told people to press a button to launch it. How far back in the chain of events do you go? The pitcher cannot throw the ball until he winds up. We not only let them wind up, but also deliver, before we start winding up. We can't do it. I am not advocating preventive war but we must change our policy, which is that we won't hit back until you hit us, or we must define much further back from the final impact time what we mean by hit.

Mr. ANFUSO. General, can you give us an opinion on the danger of biological and chemical warfare as compared with nuclear and missile warfare?

General CREASY. Yes, sir. I would point out the missile is simply a carrier. It becomes a part of nuclear warfare with a nuclear warhead, and chemical or biological warfare with a chemical or biological warhead. The nuclear bomb will certainly be effective. It will destroy buildings whether they be churches, hospitals, or powerplants. It will kill people, whether they be men, women, or children, combatants or noncombatants. It will maim many people and it will affect the future life of those who are not killed and those who are not maimed.

It covers relatively small areas, from its blast effect. It has a completely uncontrollable area it covers at the moment with its radiation fallout. From radiation fallout you have reasonable protection if you have overhead cover. These things come down and hit. The rays will penetrate but the material from which the rays come do not penetrate. We go now to chemical and biological warfare. These are weapons that can be tailored. In both chemical and biological warfare you can select agents that merely harass, that make sick, or that kill.

In biological warfare you can select an agent that kills 8 percent or 80 percent, depending upon the disease or organism you propose to use.

These materials, then, do not destroy buildings. They do, however, attack the human being, whether it be man, woman or child. There is no way for it to tell whether it is a man or a boy or a soldier or a Russian or an American; but they are much more controllable in that you drop your atomic bomb based upon the time it takes to get to your target and destroy it, and the radiation is thrown into the upper air currents. By and large your chemical agent will be put down at low level. If you have an off-shore or line attack you may use high levels, but you can put it down with a low-flying Snark, if you like, and select the area which you want to use. You can select whether you want to harass or kill.

Let us take a specific example—West Berlin. Suppose on May 27, last, our Russian friends had not backed down, as they did. What would we have done? Would we have dropped the atomic bomb in there? Would we have pulled out? Certainly you know and I know we were not about to drop an atomic bomb in there. What are we going to do with our ground forces? We have either to pull them out or support them. Would we have bombed Moscow? You don't kill trees by pulling off leaves and the root of this problem is Moscow, not West Berlin. But Russia was smart enough to localize it so we had to talk on this basis. Would we have utilized our tactical weapons in there or would we have even used our machine guns? We might have been forced to use one of these things and if we did we would have killed many of our friends on this side of the fence as well as the other side. But suppose we had had the capability at that time of going in with one of the psychochemicals that would have made them tractable for a period of 12 to 24 hours and during that period went in and took over with force, because you are still going to have to take over with force, and the infantry is still going to be occupying the ground. He may not be wearing the suit he does today but nevertheless he will have to go on and occupy the ground.

Mr. ANFUSO. You say, going into the Soviet Zone, I take it.

General CREASY. I don't want to be a Doug MacArthur even though he is one of my semi-idols and I don't have many of these—but you have to be permitted to go to the source of irritation.

Mr. ANFUSO. Right.

General CREASY. If it is a cancer you have to go in and cut it out or you have to send an X-ray in to kill it. Wherever the enemy is there is where we use these materials. By the same token you could have gone in there and used selectively a biological agent which made them sick. You could have protected with serum and vaccine to a degree some of our people, or you could have gone in with some of

the more potent of our chemical agents, even risking a few deaths if you thought it was essential. But these would be the only weapons which give you any chance for action other than getting the hell out if the Russians tried moving across the border.

Mr. ANFUSO. Can we reduce your testimony to this point that biological and chemical warfare is just as deadly if not more deadly than nuclear warfare?

General CREASY. I would not let you reduce it that much, but I will say they can be as deadly or deadlier than nuclear warfare, but they are capable of being tailored to the target and to the requirement. They need not be other than harassing, debilitating or sick-producing.

The CHAIRMAN. Therefore, it is more humane?

General CREASY. Much more humane. In fact, it is humane and the others are not at all humane.

Mr. ANFUSO. You spoke about the Hague protocol. You said for all practical purposes it is no barrier to the use of biological or chemical warfare.

General CREASY. That is correct.

Mr. ANFUSO. Do you think something should be done by international agreement to control this, just as we are trying to stop nuclear warfare, so that this sort of warfare will be terminated?

General CREASY. I would hate to see it done.

Mr. ANFUSO. You would hate to see an agreement?

General CREASY. I would hate to see us enter into any agreement with anybody so that if we are going to fight we are going to do it with our hands tied behind our back. We are dealing with people who have a history of broken agreements and a history of announcing that they will break agreements.

Mr. ANFUSO. You would favor it if both sides would carry it out, but you would not favor it unless both sides had agreed to carry it out?

General CREASY. You have posed an assumption that will not come about so I will back out of that question. No—I will answer that question: I would not favor it, even if there were an apparent agreement not to use it. If you are going to fight a war, I want you to fight it just as quickly, as fast, and as decisively as you can, and let us get about our business again. So let us not knock out those things and let us get the war over fast.

The CHAIRMAN. Mr. Karth.

Mr. KARTH. I do not intend to be abusive by this question. I hope you don't take it as such. You deplore taxes as everybody else does, but you believe it is necessary for the military to extract from the Congress huge appropriations in the billions of dollars to prepare offensive and defensive positions relating to past, present, and future wars, until between 70 and 80 cents of every tax dollar we pay, I guess, goes for wars or protection from them. You sounded as if you agreed that Russia is forcing us to a spending leading to bankruptcy, but you feel it necessary that we spend the money. You are pretty well convinced we must be the aggressor because of the modern tools of warfare today, because if we had to shoot back we might not even have a chance to do that.

Let me ask you, sir, what is your positive recommendation on what we should do, if you have one in mind at this point.

General CREASY. I want to get rid of that little red wagon first. That is not really a fair question, Mr. Karth, because this is the one that the entire administration, including the loyal opposition, has been working on in the Congress for a good, long time.

Mr. KARTH. Yes, sir.

General CREASY. Nevertheless, I will stick my neck out a little bit. I will go back to this line we talked about and say this is what we are going to do if you do that. The Maginot Line concept that we are behind now is self-destroying. The strongest advocates that we have of our missile defense programs give you a very low percentage chance of kill, a very high percentage chance of enemy missiles getting through. They know they can get through if they are fired.

Mr. KARTH. What do you mean—and if you can be more specific I would appreciate it if you could or would—what do you mean if you do this, we will do that? Does not this put us in the same position that you said we cannot be? We cannot be the retaliatory force; we must be the aggressor.

General CREASY. We have spent—and I won't put the figure on it—a fair amount of money getting a capability of delivering atomic warheads overseas.

Being in this position we have prevented a war, but we have gotten ourselves in an untenable financial position. I would say you select the 1, 2, or 3 targets, or maybe 10, in Russia and you announce to the world, if you are going to continue building atomic bombs and if you do thus and so we will drop these atomic bombs, and mean it.

Mr. KARTH. That gives me a better understanding.

General CREASY. There is an old military adage, "don't crack the whip unless you have the handle loaded". We have gone up in the heights and down in the valley of despair.

Mr. KARTH. If we allow——

General CREASY. We have allowed them to take the initiative.

Mr. KARTH. Would you go so far as to say to them, and mean it, if they start any small fires, any more irrespective of where it might be, these are the four places you would bomb?

General CREASY. I would. Yes; that is probably one of the reasons I will never be Secretary of State or Secretary of Defense.

Mr. KARTH. That is all, Mr. Chairman.

The CHAIRMAN. General, I would like to ask you this: To what extent have these gases been superseded by this nerve gas?

General CREASY. The nerve gases, Mr. Chairman, are a series of organic phosphorus fluorine compounds. You can make something from 5 to 20 different combinations of these materials that have different orders of lethality, different vapor pressures, and different persistency times.

These are the bulwarks of our American stockpile today. Now, probably for the lethal gases, they have replaced, for practical purposes, all others. If you want to do other things, and you want something that is not lethal, you have to go into other fields.

The CHAIRMAN. Do you view the new psychochemicals as a step beyond the nerve gases, giving greater versatility?

General CREASY. Yes, sir. However, the psychochemicals have limitations. Remember, and let me again point out that for major battlefield use, you are an infinite time away right now—and I do mean infinite. If you get there with the amount of money spent upon

them now, it will be just because somebody steps into a manhole by accident. If you step up the program to a decent sized program you may get there in 5 or 10 years. This does not mean a large room, but a city I am talking about now. These new psychochemicals open up a new vista of controlling people without any deaths, but they still leave the requirement of somebody coming in and taking over with force. This simply gives the soldier an opportunity to come in without being fired at. This is their niche in the world.

The CHAIRMAN. To permit him to come in without killing?

General CREASY. Yes.

Mr. BASS. Mr. Chairman.

The CHAIRMAN. Mr. Bass.

Mr. BASS. Getting back to nerve gases, you mentioned awhile ago, that we had actually conducted some experiments with human volunteers.

General CREASY. Yes, sir.

Mr. BASS. Would you describe to us in detail what happened?

General CREASY. Well, to begin with, any individual volunteer test cannot be run until it has been personally approved by the Secretary of the Army.

There are a very rigid group of protocols that have to be followed, including, among others, the fact that it must be designed solely for defensive purposes.

You cannot run an experiment on a volunteer, unless every part of the test is designed to get information to be used for defensive purposes. If you can use this information also for offensive purposes, this is another story.

Second, the action of the chemical or the disease, if it happened to be a BW experiment, must be one that you have strong animal evidence to indicate it is completely reversible.

The man—he must be a male, and he must be within the ages, I forget the ages for the minute, but I think somewhere between 18 and 35, and he has to undergo a physical examination very few in this room could pass if you had to go through it—physical and mental. With these protocols you can see they are limited.

Mr. BASS. Who are these volunteers? Are they in the Army or prisoners or what?

General CREASY. We have a volunteer program among the prisoners at the Ohio State Penitentiary. We have a volunteer program now that comes from the enlisted men in the Army. They come in from various areas. These are boys from various areas.

We have had very fine cooperation, for example, from the Seventh Day Adventists, and some of their people. And I do mean fine. I have had occasion to talk to these people a number of times and I have never known a finer group of people. They are kind of hard-nosed. You have to prove it to them. But once the chips are there they follow the rules. If you talk about the nerve gases, they are fundamentally lethal.

Mr. BASS. If I may change my question: What happened to these volunteers when you experimented with psychochemicals?

General CREASY. Let me say this: The nerve gases in a small concentration will do about the same thing to you as the pyschochemicals will. The difference fundamentally is this: The difference between the hallucinating effect of the nerve gas and the lethal effect

is a ratio of about 1 to 2. So you have a narrow limit you are playing with, but the ratio with a psychochemical is about 1,000 to 1. So you have little danger of having a lethal effect. Do you follow me?

Mr. BASS. Yes.

General CREASY. I am afraid, other than vague generalities, that if I started describing a particular experiment, I would be off base.

Mr. BASS. Do you mean for security reasons, General?

General CREASY. Yes.

Mr. BASS. That is——

General CREASY. The point is, I am no longer—I am sure of this: That General Stubbs and Dr. Van Sim, and others in that program would be delighted to come before your committee in an appropriate session and lay before you a number of experiments that I know they run. Dr. Van Sim himself underwent one of the psychochemical tests. I mean by that he became a guinea pig. He got pushed around by the other doctors just as any other volunteer would. And once he entered that chain of events he was no longer the head of the laboratory, he was just a little boy in a cage.

Mr. BASS. You have stated these experiments have been conducted on humans, in connection with those psychochemicals?

General CREASY. Yes.

Mr. BASS. But for security reasons you do not wish to reveal the details?

General CREASY. That is correct. I am sure they must be classified confidential or higher, and since I am not in charge of that work, I would prefer to leave it to the other people and I am positive they would be delighted to come in and give you just as much of it as you want.

Mr. BASS. Just one other question, General, and now I am asking you about nerve gases.

General CREASY. Yes.

Mr. BASS. You described a while ago a very, very miniscule amount of this type of gas, applied to your skin, would produce death in 10 to 15 minutes?

General CREASY. Yes.

Mr. BASS. What happens to produce that death? Why does it do that?

General CREASY. I will describe it in reference to an electric current if you will. There is a material, cholinesterase, in the system, that acts as transmitter of a nerve impulse from one nerve joint to the other. The nerve gas is an anticholinesterase. It stops the production of this material so you have a dry joint and you do not have any nerve transmission, so, for example, you have an impulse in this part of the arm that wants to go through and can't, so this starts jumping. If this type of thing happens in the nerves around your heart, your heart constricts and stops.

Mr. BASS. It produces a constriction?

General CREASY. Yes.

Mr. BASS. It is a paralysis?

General CREASY. It knocks out your nerve system throughout the body. If you come back in with the proper chemicals, you come back with the proper balance. One of these things knocks the material out and the other builds it up.

Mr. BASS. So there is a countermeasure which could be applied in time?

General CREASY. Yes. And the soldier carries the injection ampule around with him and drives it right into the thigh muscle of his leg, right through his dirty pants or whatever he has on. He does it to himself.

Mr. BASS. I also gathered from what you said a little while ago, General, that really these nerve gases and psychochemical gases are quite closely related and as I understood it, it is the concentration of doses that would produce the different effect. Am I correct?

General CREASY. What I said then was it just so happens the nerve gases in very minor fringe concentration will create hallucination effects. But the hallucination dosage is roughly half of the lethal dosage. The hallucination dosage of the true psychochemical would be maybe one one-thousandth of what is a dangerous dosage.

Mr. BASS. In other words, these psychochemicals are entirely different from the nerve gases?

General CREASY. That is right.

Mr. BASS. That is all.

The CHAIRMAN. How bulky is that product? How bulky is the material?

General CREASY. Well——

The CHAIRMAN. How much can one man carry, for instance?

General CREASY. I want to dodge just a little, if I may, because again I am a little worried about the security area.

I would say the logistics of the psychochemicals will probably for a time compare with the logistics of mustard gas, as distinguished from the logistics of the nerve gases. You have a ratio between those two things now of maybe 75 or 100 to one.

The CHAIRMAN. So it is in concentrated form?

General CREASY. Yes.

The CHAIRMAN. And not very bulky as to areas to be covered?

General CREASY. Yes.

The CHAIRMAN. Mr. Daddario.

Mr. DADDARIO. Is it your concern as the psychochemicals are being developed that they are not being properly worked into our weapons system and we are not properly setting up ourselves to defend ourselves with regard to their use against us in a future war?

General CREASY. That is right, sir. It has been my concern when I was still in the Chemical Corps, Mr. Daddario, that the program itself was nowhere near large enough. The program is woefully small, compared to the potential of that area. Again we are not talking about billions of dollars here. The amount of money in that program now is down in the hundreds of thousands.

Mr. DADDARIO. You are fearful too, as I understand it, when you take into consideration all of our public relations in this field, on the type of attack which may be levied against us, that it will drive us underground and that the attack may come and this may be just the place where the enemy would like to find us?

General CREASY. Yes, sir. As an enemy, if I found you underground I would not come after you with an atomic bomb. I would come after you with a nerve gas if I wanted to kill you.

Mr. DADDARIO. And since this is one of the capacities of the enemy, this is something we must guard against?

General CREASY. It is my feeling if we are going to build underground shelters, then they must be equipped with the proper ventilating devices to insure that the chemical and biological agents don't get into them.

Mr. DADDARIO. And if we cannot build the proper amount of underground devices to take care of the millions of people who would be exposed to such attack, should there not be information disseminated so people would know what to do in the event of an attack of this type?

General CREASY. Yes, sir.

Mr. DADDARIO. And do you feel enough information is being given out in this area?

General CREASY. I do not believe the American people are going to read any information on a subject when the American Government says this is too horrible to use and we are not going to use it. I think that is one of the basic problems we have to overcome. I did not say that to dodge your question. There has been considerable information put out.

In the room we have about 40-odd people more or less. My article on psychochemicals came out in a magazine that has—is it 13 million people who read it? I would bet you that not a quarter of the people in this room had read the article or heard of it before this hearing this morning.

Mr. FULTON. Maybe we can see how many.

General CREASY. How many people had heard of this article in This Week magazine before this morning?

[Show of hands: Three.]

General CREASY. That is my point. This is probably one of the widest circulated pieces of information media there is.

Mr. DADDARIO. There was a showing of three hands in the room.

General CREASY. I will raise mine and make it four.

Mr. DADDARIO. Does that not indicate a real effort must be made and rather than just hit this one medium we should use all the other media again in the most highly professional manner possible—television, radio, and other means of communication as well?

General CREASY. Yes, sir. I still go back to the policy, you must have a policy we are going to use these things, if we find them good. If we don't find them good let us stop working on them.

The CHAIRMAN. Let me say, General, I read it, too, as did Mr. McCormack.

General CREASY. But I think you did get my point. It is awfully hard to get information to the American people unless you have a national policy.

Mr. DADDARIO. Of course, General, you say if we are not going to use it, we must throw it away. That does not bind a potential enemy.

General CREASY. Your point is very well taken. I should like to make one more point there. The only way you can make a defensive system, is by visualizing the offensive action. So we are really trapped.

If we think there is anything to these agents, we have got to keep on digging at them offensively so that we may have a means for defense. This is important because the things that we have now were unheard of 5 or 6 years ago, and if we did not have a vigorous offensive program we could not have a vigorous defensive program.

Mr. HECHLER. I do not see where it is necessary to change our national policy on the use of these materials prior to dispensing information on them. It seems to me we could get out the information without making a radical change on our policy whether or not we approve their use. It seems to me the first thing to do is get the information out so that everybody understands, not only in this country, but behind the Iron Curtain, what these materials can do.

General CREASY. Yes, sir. I find little fault with what you say, but we must recognize that security minded people in the State Department and in the Defense Department are loathe to clear articles which they think may upset the national equilibrium. The man in uniform or the civilian in the military structure is rather hogtied if he comes up and says he does not like the national policy. He is either going to be hogtied or crucified. You just don't go out and say you don't like national policy and you only can say you don't like it within the confines of your little working area.

Mr. HECHLER. It is not the province of this committee nor do I want to get you into any discussion of high policy strategy here, but I was disturbed a little by what you inferred about outlawing these weapons, and I would just like to ask you, are you in favor of disarmament, providing it is gangster-proof, providing you have guarantees?

General CREASY. Yes, sir, I would like Utopia also.

Mr. HECHLER. The way you answer that question——

General CREASY. I just don't believe it is practicable. I think your basic premise is you are dealing with people of integrity, and since your contract is no better than your judgment of the integrity of the people who made the contract, clearly a contract of this type would be self-voiding.

Mr. HECHLER. So, in other words, you believe not even in the nuclear field our Government should carry on negotiations for disarmament?

[No response.]

Mr. HECHLER. I don't want to press this too far, except I would like to relate your answer to this whole area that we are discussing.

General CREASY. I don't believe I could qualify myself as an expert in that area, but I think it is a fruitless exercise.

Mr. HECHLER. I just want to ask one further question.

The CHAIRMAN. Certainly.

Mr. HECHLER. Were these agents, psychochemicals or nerve gases, used in Korea by Communist China in connection with brainwashing?

General CREASY. To the best of my knowledge, no, and I did not mean that as a hedge.

Mr. HECHLER. They were known at that time, but not used. Is that correct?

General CREASY. Just exactly what the Communists did in their brainwashing series, I don't know. I have every confidence they used drugs of some type, but I do not think that usage would really fall in the category that we are talking about here.

The CHAIRMAN. Will the gentleman yield?

Mr. HECHLER. Yes.

The CHAIRMAN. Were the results obtained by them indicating that they could have used that?

General CREASY. I do not think there is any question that one of the things that these materials will do is to change your behavior pattern, but if you gave the answer the man wanted it would be just happenstance. You give irrational answers.

The CHAIRMAN. It tears down completely his moral fiber for the time being?

General CREASY. I don't think I could answer that question, Mr. Brooks. I don't think I even know the answer to it.

The CHAIRMAN. You have not gone that far in your experiments?

General CREASY. No. At least, if they have I am not aware of it.

The CHAIRMAN. But at least it completely changes his behavior pattern?

General CREASY. Yes.

The CHAIRMAN. Mr. Hechler.

Mr. HECHLER. I can't get it through my thick head how it prevents a war or starts a war. Here I think we might get into a rather long discussion which we could draw out at length which would not be profitable to this committee. But I do think it is dangerous and borders on the irresponsible to suggest one.

General CREASY. Yes. I think I disavowed any intention of talking about preventive wars. But you prevent wars by occupying a position, a posture, if you will, as well as a position, that makes it undesirable for other people to start wars with you.

Your posture is the thing that keeps him from wanting to slug it out with you. But your relative position must also be maintained. If you permit him to push you further back into a corner, whether he does this geographically or financially, you have lost the war.

Someplace in this series of withdrawals, he has really struck this blow. He has started this war. I think we must further define what this point is.

Mr. HECHLER. Yes.

The CHAIRMAN. Mr. Fulton.

Mr. FULTON. May I ask the reporter to provide me with a copy of that last answer at the close of the hearing. I think that it is very good and want to quote it on the floor on the foreign aid bill.

My question is, does the person receiving the effect of the psychochemicals know of the effect that he was receiving from them?

General CREASY. No, sir; he does not.

Mr. FULTON. So that really some foreign enemy could already be subjecting us in the United States to such things and we would not know it.

General CREASY. I think it is quite——

Mr. FULTON. How can we determine it? What is the test to see whether we are already being subjected to them? Are we under it now? Are we the ones receiving it now, are we the rabbits and guinea pigs? I don't know.

General CREASY. You will have to call another witness.

Mr. MCDONOUGH. I am a little suspicious. [Laughter.]

General CREASY. I have suspected a lot of people about it.

Mr. FULTON. Mine is really a serious question. How are we to know? It could start in slightly and then go more and more and where does your perception of such a thing begin or end?

General CREASY. Basically I think if the psychochemicals we are talking about here were administered to the people in this room, the

people in this room would not know it. It would be only the outsider who came in that would find things unusual.

Mr. FULTON. I did not hear that.

Would you repeat it?

General CREASY. It is only the outsider who came in.

I mean you would not think it is at all peculiar to see Mr. McDonough dancing on the desk. You would probably get up and join him. And I would probably clap.

Mr. FULTON. Have you ever tried them on Congress?

General CREASY. I can assure you of one thing. The Chemical Corps of the Army has not found it necessary to do it up until now.

Mr. FULTON. We would not even know we are getting the treatment.

Mr. MCDONOUGH. You are not saying, General, we don't know it.

General CREASY. On this one, as my father used to say, I will call another witness.

Mr. FULTON. You said the good doctor was no longer head of the lab. He was a boy in a cage under one of these experiments. You do not mean to infer that there is the physical necessity of putting a person into a cage because of receiving these psychochemical treatments?

General CREASY. No.

Mr. FULTON. It was not that kind of a disturbance, was it?

General CREASY. No, it was not. But actually you must recognize when you are running experiments of this type, you do isolate people. You isolate them so anybody cannot get to them under any circumstances other than a real emergency.

Mr. FULTON. But it does not turn a person into a maniac?

General CREASY. No.

Mr. FULTON. So he did not really go into a cage. He was subject to the experiment.

General CREASY. He was subject to observation, and subject to observation without knowing he had the observation. Don't get me wrong. He is in an observation room. Before he goes in this room he sees all the surroundings. It is explained to him he is going to be observed. This again is part of the protocol. The full thing has to be explained to the volunteer before he volunteers. I remember when I made my first parachute jump I was asked by one of the colored boys jumping with me who had volunteered for me. I have not been able to answer that one yet, but we have a better system here.

Mr. FULTON. How broad an attack could come to us in this country in case we were attacked by psychochemicals? What should we prepare for in the area of reference of size? How broad an approach would it be?

General CREASY. Well, Mr. Fulton——

Mr. FULTON. Do you feel it would hit the whole country at once and we would lie prostrate and none of us would know what is happening?

General CREASY. Remember, I have disavowed all responsibility in this area. I am telling you what can happen, not what is going to happen.

Mr. FULTON. But what is the possible size, physically, we should anticipate and possibly defend against? Is it a small area such as gas in World War I? Is it going to be like napalm bombs that hit a

certain area of miles, or is it something you can just put up into the atmosphere and let the air currents take it in?

General CREASY. The capability of the nerve gas warfare we have today is possibly within miles or hundreds of miles. The capabilities of these psychochemicals which are still in the prototype stage is another question. But there is no reason to presume they could not eventually become of the same order of magnitude as the other chemical agents.

Mr. FULTON. When you say the nerve gases could be released on the order of magnitude of hundreds of miles, that would mean you take 10 to 20 submarines off our eastern coast and with certain winds they could blanket the whole eastern part of the United States.

General CREASY. If I may comment on that statement to this extent, Mr. Fulton, if I created the impression someone could go off the coast, and without the use of missiles, hit the mainland, I would like to correct that. Your BW concentration problem is in order of magnitude greater than your CW. That is your nerve gases. Your nerve gases laid offshore any significant distance would probably be much too diluted to do any harm.

Mr. FULTON. So they have to be by missile and what area would be covered by the CW in that target area?

General CREASY. That again depends upon many, many factors. The chemical munition today is—Bill, the sphere is wide open, is it not? [Turns to officer in rear of room.]

Lt. Col. WILLMAN. No, sir; not in coverage.

General CREASY. As to operational procedures, but not on coverage.

Lt. Col. WILLMAN. Not on coverage.

General CREASY. The chemical bomb today will probably be, and the warhead will be the same way, one of two devices: One will have in it a bunch of smaller bombs. The number can vary from 100 to 1,000 or more. As these open in the air the bombs fall out and widen the glide path, and they are so designed that they are let loose at a given altitude so you have a homogenous cloud pattern on the ground as the bombs hit. As they put more powerful material in the bomb they go up higher and spread out farther.

They also have trailers like you see producing smokescreens.

Mr. FULTON. There is no way when that missile is in a ballistic trajectory to determine whether it is a harmless civilian type missile or a warhead with these chemicals or psychochemicals. You could not tell in the air?

General CREASY. I don't believe you could.

The CHAIRMAN. Let me ask you this: Are we in effect going to finish with the general, or should we ask him to come back this afternoon?

Mr. FULTON. I am through.

The CHAIRMAN. If we are going to finish this morning, I have two little matters I want to take up with the committee before we adjourn. But I did not mean to cut anybody short.

Mr. HALL. I have no questions.

The CHAIRMAN. Mr. McDonough.

Mr. MCDONOUGH. General, does this have an effect on either the brain or heart, or what part of the anatomy does it affect?

General CREASY. The psychochemicals?

Mr. MCDONOUGH. Yes.

General CREASY. Different ones affect different parts of the anatomy, Mr. McDonough. Presumably you could produce a chemical to cause temporary blindness or temporary deafness. They are all types of portals of entry into the system. Whatever sense that you have this can be attacked.

The ones that we are talking about, these actually do produce mental hallucination, the ones that reverse the behavior pattern. These are transitory, they are gone after 24 to 48 hours. Every individual who has participated in this program has been observed for a matter of weeks very closely, and then for a long period after that. Obviously if you were positive there were not going to be any other effects you would not run tests, but so far there has been no backlash of any kind.

Mr. MCDONOUGH. Is he under a state of fear while he is under the influence of these chemicals?

General CREASY. Well, going back to the cat and mouse thing, it was quite apparent that cat certainly seemed to be afraid of the mouse. This is one of the effects that you can get from one of the derivatives.

Mr. MCDONOUGH. In your experiments do you find the individual conscious of what condition he was in while under the influence, or unconscious of it?

General CREASY. A little like amnesia. Sometimes yes and sometimes no.

Mr. MCDONOUGH. Have you attempted to create this situation and immediately neutralize it, when you see the effect on an individual?

General CREASY. I cannot answer that because I don't know, Mr. McDonough. Remember, I have not seen this program now for 10 or 12 months.

Mr. MCDONOUGH. In other words, do you know, or is there any record where an atmosphere has been created that an individual was in and the effects were noticeable, and there was an immediate attempt to neutralize or there was any neutralizing agency?

General CREASY. I am sure the question can be answered. I cannot answer it.

The CHAIRMAN. You have testified that there is a neutralizing agency.

General CREASY. No, sir. There is for the lethal gases, the nerve gases. Mr. McDonough was talking about the psychochemicals.

Mr. MCDONOUGH. What are the psychochemicals? Can you name them?

General CREASY. The only name that I know that has been discussed in the open literature are the various derivatives of lysergic acid.

The CHAIRMAN. Are there any further questions?

Mr. Fulton, do you have any further questions?

Mr. FULTON. The question comes up, does the individual under either the psychochemicals or the nerve gases know the difference between right and wrong?

General CREASY. I would much prefer to have you go into this type of question, to get the people in the Chemical Corps who have worked on this type of program, preferably Dr. Van Sim.

The CHAIRMAN. Thank you, General. You have given us a very fine statement all the way, though impromptu and not committed to writing, but a very illuminating statement.

If there is no objection at this time, I would like to present to the committee the two reports. The first is titled "Nuclear Explosions in Space," and the second "Status of Missile and Space Programs."

Those two have been distributed to the members for reading. I have heard no objection to them. Unless there is objection they will be approved.

Mr. HECHLER. I object to adopting the report on Nuclear Explosions in Space. It arrived at my desk this morning.

The CHAIRMAN. We will set it aside, then.

Is there any such situation regarding the other?

Mr. FULTON. Will the gentleman yield?

Mr. HECHLER. Yes.

Mr. FULTON. Yesterday the newspapers carried a report on the nuclear explosions which were made at Johnston Island.

Mr. HECHLER. Nevertheless, I do not feel I can conscientiously pass it out now.

Mr. FULTON. I was going to move it be reported out the day before yesterday for timing. I would like this Argus report out before the Hardtack report.

The CHAIRMAN. I want to say this, too: I am not too happy because we have lost position in not getting our reports out as promptly as we should. Some of them are not timely now.

If there is no objection to the "Status of Missile and Space Programs," you have heard the motion duly seconded. All in favor say "aye."

All opposed.

The "ayes" have it, and that report is formally approved by the committee, and it will be released for publication.

The other will be taken up in the morning.

If there is no further business, the committee meeting is recessed until tomorrow morning at 10 o'clock.

(Whereupon, at 12:05 p.m., the committee recessed.)

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE AGENTS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
Washington, D.C., Monday, June 22, 1959.

EXECUTIVE SESSION

The committee met, pursuant to notice, at 10 a.m., in room B–214, New House Office Building, Hon. Overton Brooks (chairman), presiding.

The CHAIRMAN. This morning we have a fine witness, Maj. Gen. Marshall Stubbs. We are glad to have you.

By the way, Stubbs is a good Louisianan name.

The briefing this morning is a continuation of our briefing of an earlier date where we received certain information regarding chemical and psychochemical warfare and materials. Now I understand the briefing this morning will be a secret briefing; is that correct?

General STUBBS. It is top secret, sir.

The CHAIRMAN. You have a statement that is subject to release, though; do you not?

General STUBBS. Yes, sir; we have prepared an unclassified portion.

The CHAIRMAN. Well, now our staff can release the unclassified portion, and we can then proceed with the top secret statement.

General STUBBS. Yes, sir; and I have prepared, sir, a statement and included in this are several film clips at the end of it, and then following that I have a demonstration to present to you if you would care to have it.

The CHAIRMAN. It is needless for me to tell the members of the committee how important this is, but I want to say a brief word about General Stubbs.

He was born in Superior, Nebr., 1906; was graduated from the Military Academy in 1929. He served with the Infantry until 1934 when he was transferred to the Chemical Warfare Service. He is a graduate of the Infantry School, Chemical Warfare School, National War College, and Command Management School. He obtained a master of science degree from MIT. In World War II General Stubbs served in the European theater of operations as chemical officer of the 8th Air Force Service Command and later the 9th Air Force Service Command where he organized a chemical section of the headquarters.

He was assigned to the advanced sections, communications zones, as chemical officer in 1944. After the war he served as Chief of the Communications Zone Section of the European Theater General Board and later served in G–4 offices of the U.S. Forces, European theater. In 1947 General Stubbs was assigned to the Army Chemical Center.

He served as Chief, Research and Development Division, Office of Chief Chemical Officer in 1954 when he was assigned as commanding officer and later commanding general, chemical commanding general First Logistics Command. He was in that post when he was appointed Chief Chemical Officer in 1958. He has all kinds of decorations, I might say. You can look at his breast and see that.

We are happy to have you, General Stubbs.

Mr. MILLER. Where is Superior? Being one who is fairly familiar with Nebraska, my wife coming from there, you have me stumped for a minute.

General STUBBS. It is down on the Kansas-Nebraska line, sir. It is about midway out in the State.

Mr. MILLER. Do you know where Alma is?

General STUBBS. Yes.

Mr. MILLER. How far is it from Alma? Well, all right, you come from the good part of the State, not the sand hills.

General STUBBS. Those sand hills are wonderful too, sir.

The CHAIRMAN. It is nice to have you, sir, you may proceed.

STATEMENT OF MAJ. GEN. MARSHALL STUBBS, CHIEF CHEMICAL OFFICER, U.S. ARMY

General STUBBS. Mr. Chairman, members of the committee, I am pleased to discuss with you the Army's programs in chemical, biological, and radiological warfare.

[Top secret presentation was not reported.]

We provide the services with chemical and biological material and equipment. For all practical purposes the Army's toxicological warfare programs are the programs of the Department of Defense. Now as to the characteristics and concepts.

Chemicals and biologicals have certain unique advantages which are not found among other military weapons systems. First, they are search weapons in that they seek out the enemy, whether he is widely dispersed or concentrated in fortifications. Like a fog they blanket an area and cover all crevices. Thus they will reach personnel physically protected from blast, thermal or fragmentation weapons.

Second, chemical and biological agents offer a wide variation of effects ranging from highly lethal down to the mildly incapacitating. This provides a flexibility unknown with the highly explosive nuclear systems.

Third, toxic chemical and biological warfare weapons are minimum destruction weapons as far as materiel is concerned. They are highly effective against personnel but leave the cities intact. This is important not only in the case of our use of captured facilities but in the case of the reestablishment of the general economy at the end of the war.

Finally, in terms of critical material and total cost, chemical and biological warfare would produce major effects with a comparatively minor logistical effort. Concepts of employment of chemical and biological warfare have been developed to make maximum use of these unique properties.

Our nerve gas, GB, is a nonpersistent agent, particularly adapted to the generation of toxic vapor clouds for attack of hard targets, such as concrete redoubts and underground fortifications. Another type

of agent, * * * , is a persistent material producing effects both by inhalation and absorption through the skin. Since it will readily penetrate clothing, it could be employed effectively against massed personnel. If we do not wish to kill, there will be the incapacitating agents. These are the agents you may have heard about recently which upset behavior patterns and produce temporary mental or physical incapacitation without permanent injury. These could be used for the humane accomplishment of difficult missions such as dislodging an enemy from an area inhabited by a friendly population.

In biological warfare we have formulated two basic concepts of employment, the limited target type of attack and the large area coverage type of attack. The first, the limited type of attack, can be accomplished by on-target application of various types of bomblets from either aircraft or missiles or by off-target attack employing spray from aircraft, drones, or by small portable generating devices.

Since * * * an airborne biological warfare attack is difficult to detect, such off-target attack with subsequent cloud travel to cover the target could readily be accomplished by the enemy. The second basic concept envisions the attack of entire enemy land masses with aircraft missiles or drones, each dispersing large quantities of biological agents, a large area coverage type operation.

The two concepts differ in one respect in area covered: * * *

Russian leaders, both political and military, have publicly stated that the next war will include the use of—and I quote—"various means of mass destruction such as atomic thermonuclear, chemical and bacteriological weapons." * * * The Soviet civilian population receives thorough training in defense against chemical and biological warfare. Through its civil defense organization, over 30 million persons have already been trained and this training is in progress today, extending to the smallest outlying community. Similar programs are in progress in the satellites.

* * * The Soviets are engaged in intensive research and development in both chemical and biological warfare. * * * Their interest is not confined solely to lethal agents but encompasses a wide variety ranging in effect from those producing mild incapacitation to death.

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(Top Secret chart was presented at this point.)

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* * * It seems to me that the deep interest of the Soviets and the critical resources they are expending can mean only one thing. They plan to and will take the initiative in waging chemical and biological warfare if it is to their advantage.

Concerning our status and future prospects, I shall cover this by a brief discussion followed by a film and demonstration showing some of our recent developments and concepts. Major advances in chemical warfare agents and munitions have been made in recent years. We have both on hand and in research, agents 10 to 50 times more toxic than were available a few years ago. Concurrently we are developing more effective means for dissemination of these agents and in addition to the conventional aircraft spray systems, aerial bombs, and ground munitions. * * *

One of the most promising agents recently developed will serve as an effective complement to the nonpersistent GB, and can be used as the agent fill for a number of munitions.

In addition to our work in the nerve gases we are seeking new toxic substances which will attack other vulnerable systems of the body such as the eyes and the mind. Another area of research to which we are giving increasing and equal attention is that of incapacitating agents, capable of temporarily causing physical incapacitation without permanent injury. I am very optimistic about the possibilities in this field. We are not only investigating the psychochemical agents such as LSD 25, which causes mental incapacitation, but also compounds which cause physical incapacitation.

We have several promising candidates under study at the present time. * * *

We shall demonstrate the effects of one of these type compounds to you today. You will be interested to know of the help and cooperation we are getting from industry in this program. Through our industrial liaison program we are receiving about 400 potential compounds a month from drug and pharmaceutical houses.

The characteristics we are looking for in these agents are in general exactly opposite to what the pharmaceutical firms want in drugs, that is the undesirable side effects. The two physical incapacitating compounds I have just described to you were received by us in the above manner. I think this will give you some indication how closely we are cooperating with American industry.

We are attempting to completely separate these agents from the lethal agents so that any castigation normally given to toxic agents will not be associated with these agents, since these do not maim or kill. As a result we hope to have a weapon which will give the commander much freer reign in its use as compared to toxic agents. It is my hope that through the use of incapacitating agents the free world will have a relatively cheap and rapid means of both fighting and deterring limited war which has come to the forefront in the international political scene in the last several years. It is one means by which we can maintain some degree of equality in the face of the overwhelming manpower superiority of the Communist-dominated nations.

I will now turn to the means of delivering agents. * * *

In our biological warfare agent program, we have also developed both lethal and incapacitating agents.

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What about defense against the enemy use of chemical and biological warfare? There are two basic problems we face here. One is to provide the individual fighting man with adequate protection without overburdening him to the point where his combat capability is seriously affected.

* * * * * * *

For individual protection I am pleased to state we are planning early production of our new canister protective mask. It is a decided improvement over our previous mask in wearability and in ease of breathing and will completely protect the face and lungs.

* * * * * * *

We together with the Army Quartermaster Corps are giving high priority to developing a three-way impregnation system which will make general issue quartermaster clothing self-indicating and self-decontaminating and at the same time prevent penetration through the fabric.

Along with the Surgeon General we are investigating promising compounds for the prevention as well as the treatment of chemical and biological warfare casualties. Our continuing objective is to provide the soldier with a more simple and more effective method of protection.

* * * * * * *

Incidentally, we make all information available on these programs available to our other interested Government agencies.

So far I have provided you only with information on chemical and biological warfare. The mission of the Chemical Corps also encompasses radiological warfare. We determined the military feasibility of offensive radiological warfare, that is the deliberate use of radioactive pellets to contaminate an area. * * *

Our present efforts are restricted to monitoring the AEC reactor program to determine the future availability of radioactive byproducts from fission reactors.

In the area of radiological defense, however, the Chemical Corps is conducting an active program. We are studying the problems associated with radioactive fallout and we are investigating gamma and neutron shielding to obtain data needed for operational protection and for new equipment and tactics. We are expanding our educational program and we intend to take whatever steps are necessary to develop Chemical Corps officers as the Army's experts in radiological defense. * * * We are continuing our work on a tactical gamma-neutron dosimeter.

Finally we plan the establishment of a test center at the U.S. Chemical Corps Proving Ground in Utah to provide a facility designed to simulate the fallout fields which may occur in nuclear war.

Now I should like to show a short film which demonstrates a number of the items and concepts which I have spoken about and which also includes information on other fields in which we have important responsibilities, namely smoke and flame, which I am prepared to discuss with you later.

The CHAIRMAN. Before we do that I will ask the members to move around here on the side where they can see. If any member has difficulty there are lots of seats here available.

Mr. TEAGUE. General, while we are waiting, what does "standardized" mean?

General STUBBS. An item is standardized after it has successfully gone through research, development, engineering, and user tests, and is ready for production.

[A film was shown.]

General STUBBS. I would now like to present a demonstration: *Lt. Col. Douglas Lindsey, Medical Corps Director of Medical Research at the Chemical Warfare Laboratories in the Army Chemical Center.*

STATEMENT OF LT. COL. DOUGLAS LINDSEY, MEDICAL CORPS, DIRECTOR OF MEDICAL RESEARCH, CHEMICAL WARFARE LABORATORIES, ARMY CHEMICAL CENTER

Colonel LINDSEY. Mr. Chairman, gentlemen of the committee, I would like to put my presentation in context by telling you another story from another context.

In my old days in Webster Parish I knew a squire who had a motor vehicle, a Model T Ford, and he would go by and ask the neighbors "Is there anything I can do for you in town?" And one day Mrs. Wardlaw said "Yes, there is something you can do for me in town. I need some good bluing; would you get me some good bluing, please?" And he said, "Mrs. Wardlaw, I will go by Henry Lowe's store and I will get you some bluing, but how will I know it is good bluing?" She says, "You break off a piece and if it is good bluing it sinks or it floats, and I am not sure which."

I am not sure whether you will feel this animal act sinks or floats, but whether it does either we are sure the stuff is good.

We know the committee has heard something about psychochemical agents and we would like to show you another side of the story and also to elaborate at your pleasure on psychochemical agents.

With us today is Dr. Sim, who I think is one of the world's experts on psychochemical agents, and Dr. MacNamara, who will illustrate a physical incapacitating agent. We prefer to refer loosely to these types of incapacitation, psychological and physical, as "off the rocker" on one hand or "on the floor" on the other. These are sort of loose references because it is not necessary to drive a man completely off the rocker to incapacitate him psychologically. You can do this, for example, by blocking his ability to integrate time and distance in which case he cannot judge speed, he cannot fly an aircraft, he cannot shoot a gun from or at a moving tank or con a ship from the bridge. It is not necessary to lay a man on the floor in order to incapacitate him physically. This can be done by say producing some sort of critical paralysis or rigidity or alternating paralysis and rigidity such as paralysis agitans, and Parkinsonism, physiological Parkinsonism. Dr. MacNamara will illustrate for you a physical incapacitating agent.

STATEMENT OF DR. BERNARD P. MacNAMARA, CHIEF, TOXICOLOGICAL DIVISION—MEDICAL RESEARCH, CHEMICAL WARFARE LABORATORIES, ARMY CHEMICAL CENTER

Dr. MACNAMARA. Gentlemen, we are going to demonstrate for you a harmless and a completely reversible type of physical incapacitation.

The chamber that you see here is an aerosol exposure chamber. These animals will be exposed to this aerosol, will be allowed to breathe it for about a minute. They will be completely unharmed and recover completely from what is going to happen here.

* * * * * * *

The only thing that you may notice with these animals, they do not like to be held and do not like to have their nose held in this chamber so they object to that a bit, and they do not like the noise that the motor makes when we turn this motor on. This is necessary because it keeps the chamber at a negative pressure and prevents the aerosol from leaking out into the room.

Other than the struggle the dog makes in being held no harmful effect will occur in these animals.

Now this starts the blower system to make the chamber safe. Now that releases the aerosol. If you gentlemen look very closely, you can see the aerosol being sprayed from this container. It immediately becomes an aerosol and becomes invisible because of the very minute quantities of agent involved here. The material in this bottle is 99.9 percent inactive solvent and one-tenth of 1 percent active material.

Now the exposure has only gone 30 seconds and already these animals are beginning to relax. I will count off the last few seconds for the benefit of the operators. Ten, nine, eight, seven, six, five, four, three, two, one, and that is the end of the aerosol exposure, gentlemen.

Now I will allow this filter system to run for just a short time to make sure nothing leaks out into the room. Any leakages are into the chamber, gentlemen, nothing comes out.

Now you can see a minute and 25 seconds has elapsed since the start of the exposure and both of these animals are immobilized.

The CHAIRMAN. How many seconds, 25?

Dr. MACNAMARA. They were exposed, sir, 1 minute total, and they were in this condition before this exposure actually ceased.

Now to show you that the effects of this compound are completely reversible we have a laboratory antidote which can reverse the paralyzing effects of this compound.

You will notice that was 2½ minutes on the clock and within 2 or 3 minutes this animal will get up.

The CHAIRMAN. Will he or she be all right?

Dr. MACNAMARA. Yes, sir, these animals have been reexposed many times.

The CHAIRMAN. In 3 minutes he will be all right?

Dr. MACNAMARA. He will not be completely recovered, sir. Actually, sir, although this antidote removes the paralysis, a man who had the antidote would still be incapacitated mentally because the antidote itself affects the mentality.

Mr. TEAGUE. How does it affect the mentality?

Dr. MACNAMARA. It is a derivative of * * *. It causes drowsiness and confusion. So the antidote would not make a person that was treated fit for combat or fit for active duty.

Mr. KING. Do you have something that makes people smarter?

Dr. MACNAMARA. I am afraid not, sir.

Mr. OSMERS. How long would it take before a man would recover completely?

Dr. MACNAMARA. Sir, the compound which caused this paralysis is an experimental compound. * * * This is the way it has worked in most of the species we have tested.

Mr. OSMERS. I have referred to his mental capacity.

Dr. MACNAMARA. * * *

The CHAIRMAN. Would not your recovery time depend on the length of time to recover from the antidote rather than the original gas?

Dr. MACNAMARA. That is right, sir; we are not demonstrating the antidote as an antidote but just to show that the incapacitating agent is reversible in nature, that it does not kill the animal.

Mr. FULTON. What compound is this a derivative from?

Dr. MACNAMARA. * * *

Now we have another compound here, gentlemen, that is much further along, a compound which has been tested in quite a large number of people. The compound that we are going to show you now is not as potent as the one you have just seen. It requires about 50 times as much material to cause paralysis.

This compound * * * causes paralysis. It has been used for * * *. The air-borne dose of this second material would be about one-quarter or one-third of the amount of cyanide that is necessary to execute criminals; or another comparison, the amount of this second material that would be needed in the air would be about the same quantity as mustard if we wanted to produce skin blisters with mustard, so that this second compound is within the realm of feasibility even though it is not quite as potent as the compound you have just seen.

Mr. MILLER. During World War I you could use masks against mustard and phosgene. Can you develop a mask against these?

Dr. MACNAMARA. Yes, a gas mask would be effective against this. However, I think it would be possible to disperse this material without anyone being aware of it. As an aerosol it would be colorless and odorless and I doubt very much that anyone would know when to put the mask on.

The CHAIRMAN. It is difficult to detect phosgene, too. It is a slightly onion smell but it is hard to detect.

Dr. MACNAMARA. Yes, this would be even more difficult. This compound, gentlemen, we are going to do this by intravenous injection because we do not have two chambers set up to do this.

Mr. OSMERS. This is less powerful than the first?

Dr. MACNAMARA. Yes, but this one has been used in man. Before we demonstrate this second compound, I would like to give you some idea of the potency of the first compound. If you will look closely at these ampules when they are circulated, you will notice there is a bit of powder in the bottom of these ampules. * * *

Mr. MOELLER. Why did you not give a shot to that second little dog?

Dr. MACNAMARA. He will come out of it all right, and we wanted you to see that recovery occurs naturally. Now to demonstrate the second compound. The dose will last anywhere from a half hour to 2 hours. It is possible by increasing the dose, that it will last 48 hours. * * *

Mr. RIEHLMAN. How long before he becomes normal, did you say?

Dr. MACNAMARA. A half hour to 2 hours at this dose level. You can produce a longer paralysis by increasing the dose.

Mr. BASS. This is not an arsenic compound?

Dr. MACNAMARA. No. * * *

Now, gentlemen, you will notice that this animal will become immobilized in about 1 or 2 minutes. After that Dr. Van Sim will then take up this demonstration and continue from there.

The CHAIRMAN You can bring that one out all right with no bad effects?

Dr. MACNAMARA. This one will come out by himself, also. We do not have an antidote to reverse the effect of this compound. This compound in addition to causing this paralysis also produces hallucinations. * * *

He is dropping now, and that is 1 minute from the time he was injected.

Mr. OSMERS. Mr. Chairman, during the first experiment, does that give a complete anesthetic effect?

Dr. MACNAMARA. Yes. Well, these actions are somewhat different from anesthesia as we are used to understanding it where the mentality is completely obliterated. * * *

If the dosage is raised, then the mentality is blotted out along with the other effects.

Mr. OSMERS. Is the first substance being used for anesthesia yet at all?

Dr. MACNAMARA. No, it is not. It has not reached the point where anyone is doing extensive human experimentation work. Dr. M. Van Sim.

STATEMENT OF DR. M. VAN SIM, CHIEF, CLINICAL RESEARCH DIVISION, CHEMICAL WARFARE LABORATORIES, ARMY CHEMICAL CENTER

Dr. SIM. Gentlemen, the concept of offensive warfare with the utilization of such compounds as you have seen this morning in the film and in demonstration, i.e., the concept of causing incapacitation and being able to accomplish the mission of whatever service is involved is one that is new. Poisons are not new. They go back to history, but the concept of giving a compound in which the effects are totally reversible certainly is of interest not only from the offensive standpoint but also from the defensive standpoint.

Now we have been conducting for the past 4 years under the Department of Defense and Department of Army a volunteer program in which the members of the Continental Army Command and the Air Force send volunteers to this program.

This volunteer program encompasses the whole field of medical protection and medical treatment against the lethal compounds as well as the study of compounds which we feel are perfectly safe to put in the human.

Now in order to say "perfectly safe" it means extensive work over a period of years in which we are totally satisfied that there are no acute effects from this compound that persist and there are no chronic effects that may come up later. This program has been in effect for the past 4 years. We have taken these compounds ourselves, not because we want to be the first, but because of certain aspects and measurements of each experiment we conduct, we feel are better conducted on ourselves who have a more objective idea about what the experiment should show in relation to the electroencephalogram, the brain recordings and the various muscle tone tests and so forth.

We started on L.S.D. as a compound over 4 years ago and we first gave it to individuals and then in groups to see whether we could manage groups and then into the type of more objective testing that you saw in the Fort Bragg test. Those men were not able to do the job.

I would like to emphasize again to you the dose of such a compound as L.S.D. * * *

Other compounds that we have show equally fast onset of action. They can be spread by aerosol or in water supply. They persist much longer. Some of them in very small doses will last as long as 72 hours. They cause both physical and mental incapacitation and we do have

to consider the possibility from a defensive standpoint as well as offensive that these compounds of the psychotropic type which are either depressant or stimulatory to the central nervous system may be used against us. There is certainly no doubt in the mind of anyone who has worked with these compounds of their potential covert use at the present time. * * *

Mr. MILLER. Do we know whether or not the Chinese have this?

Dr. SIM. We know certainly that the Russians have them.

Mr. MILLER. There was some indication that the Chinese were using it as a sort of truth serum. I believe you lost your will to conceal. They were applying it to people, or a compound of such nature.

Dr. SIM. You do lose your will. One of the compounds will stress a person very rapidly if he is placed in isolation, he is very easy to interrogate. So the problem of its covert use, and its use in interrogations are certainly being worked on with a great deal of interest.

General STUBBS. I would like to finish the comments I have, sir, and then to summarize.

* * * Looking into the future, I am certain that we will see major advances in the art and science of chemical and biological warfare. The application of discoveries in science and technology to these warfare systems will result in orders of magnitude increasing the effectiveness and capability.

I need not point out that this will require unrelenting effort and adequate support. I feel that the United States cannot afford to be too little and too late in chemical and biological warfare. We in the Army will make every effort to see that this does not happen, sir.

I might comment further on the two questions that were asked me. When we speak of standardization, we mean that an item is accepted by the service, and is ready to go into production; and * * *

The CHAIRMAN. Now, General, we want to thank you very much for a most impressive presentation by you and your staff. I want to ask you this: What amounts are available of these substances? Is there a limited amount or unlimited, or just what would you say? Do we have unlimited supply of the raw materials?

General STUBBS. There is no lack of the raw materials, sir.

The CHAIRMAN. So these products could be produced in unlimited quantities and if used could cover limitless amounts of territory and limitless numbers of people?

General STUBBS. * * *

The CHAIRMAN. What about the others?

General STUBBS. The "G" agents can be made in almost limitless quantities.

The CHAIRMAN. Now are you satisfied with the progress of your program under the mission that you have defined for you in warfare?

General STUBBS. I feel that we must go faster than we are at this time.

The CHAIRMAN. How much money are you getting for your program?

General STUBBS. In research and development we have gotten on the order of $35 million or $40 million a year, sir.

The CHAIRMAN. And all of this is being done with that amount of money?

General STUBBS. Yes, sir.

The CHAIRMAN. What amounts could be used to push the program faster?

General STUBBS. We of the Chemical Corps feel that to fully exploit these materials we should build up to an expenditure of approximately $125 million a year, sir, and this graded so you would expend that which could be efficiently expended, say $65 million in 1960, $80 million in 1961, and then $125 million and stay at that level from 1962.

Mr. MILLER. Is any of this work being done at Detrick?

General STUBBS. Yes; that is the research center for biological warfare. The Chemical Warfare Laboratories at the Army Chemical Center are the chemical and radiological laboratories. The principal field test work is done at Dugway, Utah.

The CHAIRMAN. Mr. Teague.

Mr. TEAGUE. Can you tell us a little bit about the problems of storage?

General STUBBS. In chemicals we have no real problem with such as the "G" agent. They last for a long time.

Mr. TEAGUE. For example, if you had trouble with Russia would it be one of your primary targets, to destroy their storage of agents?

General STUBBS. It depends on how much they have, sir, and how well they have it distributed whether it would be really productive to attack a storage point.

On the biologicals, of course, this is a real problem to us because these are living organisms and they die so they do not have a limitless life. There is much variation in different agents, some of them live well, some of them live very poorly, and under different conditions. Some conditions would cause them to live longer and other conditions would cause them to live shorter. Heat and ultraviolet light are the two things most destructive to them, Mr. Chairman.

Mr. TEAGUE. That is all, Mr. Chairman.

The CHAIRMAN. Mr. Osmers.

Mr. OSMERS. Mr. Chairman, I wanted to get two terms straightened out in my mind. As I understand it, the GB product is nonpersistent and the other product is persistent. Now is that persistent as to the person affected or persistent as to its length of time that it will remain on the ground?

General STUBBS. The latter, sir.

Mr. OSMERS. Now in your presentation, General Stubbs, you made a very interesting statement about the fact that you receive 400 products or formulas a month from the private drug industry in the United States. That would be approximately 20 every working day on an average.

May I ask you what you are able to do about these considering the limited staff that you must have and the tremendous significance that some of these substances must have?

General STUBBS. Sir, we screen those first by the knowledge of people, that is our people are able to eliminate many through their basic technical knowledge. This eliminates 9 out of 10 on the first round.

Then we take them to animals, the 1 out of 10. This will eliminate another 9 out of 10, so before we have spent a great deal of money or time, we have reduced them to a small number.

Mr. OSMERS. One final question, Mr. Chairman: Are all of our drug and chemical concerns fully alerted as to the need for sending to the Government any significant discoveries which they may make in this field?

General STUBBS. Not completely, sir, but we are in the process of informing additional ones as rapidly as we can get to them.

The CHAIRMAN. Mr. Sisk.

Mr. SISK. I simply have one question with reference to the thought brought up by Mr. Teague, and that has to do with the storability of these items and I have in mind primarily your discussion here on biological or bacteriological agents, * * *.

Now do I understand from what you have said that you are attempting to develop or have already developed * * * agents that could be used for these diseases? I assumed it required living organisms, that is an actual bacteria of some kind; that is why I was curious about it.

Dr. SCHWAB. * * *.

Mr. SISK. What are the dangers? Are there inherent dangers in the storing or handling of these items? I am thinking now from the standpoint of the population.

Dr. SCHWAB. We do have safety problems. However, that has all been worked out and is under control.

Mr. SISK. You feel it does not represent a great problem?

Dr. SCHWAB. No.

Mr. SISK. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Van Pelt.

Mr. VAN PELT. No questions, sir.

Mr. RIEHLMAN. Mr. Chairman.

The CHAIRMAN. Mr. Wolf, and then I will get over there. Some of you are out of place there and I have a little difficulty.

Mr. RIEHLMAN. I am in my place, Mr. Chairman.

The CHAIRMAN. Mr. Wolf.

Mr. WOLF. The only questions, you made a statement if we get up around $125 million a year we can fully exploit. Do you mean by this we can manufacture the adequate quantities we should have with that figure?

General STUBBS. That amount is for research and development only, and does not include any production, sir.

Mr. WOLF. That is what I thought. I did not think that was clear.

General STUBBS. I am glad you asked that question.

Mr. WOLF. You feel that because of the tremendous quantity that the Russians apparently have of these various things that this is a very serious threat to even localized wars, these so-called brush-fire wars in the future?

General STUBBS. I feel that it is, sir.

Mr. WOLF. * * *.

General STUBBS. * * *.

Mr. WOLF. Well, do we have the equipment to protect our boys? Can we put a force in the field that is protected against their chemicals?

General STUBBS. Of course if I may broaden this one out just a little bit, sir, it is not only our own field people, it is our allies that I think we must bring up to an ability to handle these materials. This is the problem that we face, sir, I think. We do have within our service, we do have an excellent protective mask. This will protect the respiratory tract.

Mr. WOLF. But it will go in through the skin and it will take clothing?

General STUBBS. That is correct. * * *

Mr. WOLF. Well, is there sufficient money to do this, the manufacture and production of this in the budget right now even if it were agreed that we had to have it, and apparently it is agreed at least by you?

General STUBBS. * * *.

Mr. WOLF. But at the present time we do not have anywhere near the money it would take to equip even our own people in the field if we have to?

General STUBBS. We have sufficient masks to equip our—would you finish my statement, Colonel Gibbons, on the mobilization requirements?

Colonel GIBBONS. * * *.

Mr. WOLF. We could make these available to our friends overseas?

Colonel GIBBONS. No, sir, this is only for the Army.

Mr. WOLF. Do any of our friendly allies supposedly have any plans to encourage this sort of thing in their own troops or any monies available, do you know?

General STUBBS. Colonel Baker, can you answer this, please?

Colonel BAKER. * * *.

Mr. WOLF. I am just wondering, Mr. Chairman, if in all of the glamor connected with the missile program we have not overlooked something pretty big.

The CHAIRMAN. This is basic and fundamental.

Mr. RIEHLMAN. My questioning, Mr. Chairman, is right along that of my colleague, Mr. Wolf. I am worried about the defense to this dreadful chemical warfare that is facing us. If I am not mistaken, General, in your statement you referred to the civil defense program that is carried on by the Russians. Do we have definite information as to what they are doing to protect their people along that line? Is it an effective program?

Dr. GORDON. This is an extremely effective program. It has been in evidence and in practice for several years. The General indicated that upwards and possibly today even more than 30 million people in the U.S.S.R. have been trained and have become imbued with the need for this defense C.B.R.-wise among the civilian population. This is very, very true and very, very evident.

Mr. RIEHLMAN. We are talking about limited defense right here today, for the military, defense of the boys in the field. What are we going to do about the civilian situation?

Dr. GORDON. You put your finger on the heart of the problem. That is the real problem.

Mr. RIEHLMAN. It is not a question of whether we will defend our boys in the field, but what are we going to do to defend the population of the United States of America or the NATO nations against this type of warfare. We will be totally crippled and incapacitated if hit with this type of warfare, am I correct, General?

General STUBBS. It is my personal estimate that we could be, sir. I am by no means alone in this judgment, but others may not agree on the nature and extent of the threat and the calculated risk that it is reasonable to accept. I feel quite safe in saying, however, that at present we are highly vulnerable to attacks that may well be within the U.S.S.R. capability, and that could, as Mr. Riehlman suggests, severely cripple this nation.

Mr. RIEHLMAN. Now, we get back to this other point, and, Mr. Chairman, I have been on the committee for a number of years. We have been talking about civil defense in the United States of America, and we just cannot raise the eyebrows of a Member of Congress for the need of expanding this type of program but to me it is just as important as it is today to spend billions of dollars for missiles, to spend a few hundred million dollars to protect our own people in the United States of America.

Mr. MILLER. Will my colleague yield?

Mr. RIEHLMAN. I am not making a speech, I just want to finish this. I am vitally interested in this thing and to me it is the heart of what will happen here. We can have all of the defense we want, all of the missiles we want but if we are hit with this type of warfare and we are not in a position to meet it or to protect our people, we are just absolutely sunk and we may as well face that thing.

Now, I end with this, Mr. Chairman: I think it is important and very important today that the American people know more about this dreadful type of warfare so that somewhere along the line we can alert them to having some type of protection for the civilian people of our country and we do something in the NATO nations because it does not make any difference what we have got in missiles or all of the rest, if we are hit with what we have seen here this morning, my friends, the hope of defending our country and the other nations is just hopeless.

The CHAIRMAN. The gentlemen have been impressed as I have been.

Mr. RIEHLMAN. I would like a statement, General, as to how you feel about this.

General STUBBS. I am very much disturbed, sir, about the safety of this Nation with what I know about the potential of these materials.

Mr. RIEHLMAN. And if we can have a substantial amount, it can probably be a greater deterrent so that maybe our enemy will not start to use this type of warfare; but, if they feel that we are not in a position to defend ourselves, it is a greater encouragement to use it and probably they would.

General STUBBS. It is my feeling that these materials can really be made a deterrent to war. Of course, this is a very strong statement, sir, but I do feel that they can.

Mr. RIEHLMAN. With the greater quantity of them and with our enemy knowing what we have.

General STUBBS. This, I think, is an essential element.

Mr. RIEHLMAN. And that the public be alerted to the dangers of it.

General STUBBS. This is an additional essential element not only to our people, but to the people of the free world.

The CHAIRMAN. Mr. Roush.

Mr. ROUSH. I have no questions this morning.

The CHAIRMAN. Judge Chenoweth?

Mr. CHENOWETH. I would like to ask you, General, is there any connection with your program and the activities in the Denver, Colo., arsenal?

General STUBBS. That is our GB plant at Denver.

Mr. CHENOWETH. You are still using that?

General STUBBS. That is in standby now. * * * That is on a standby basis now.

[Discussion was off the record.]

The CHAIRMAN. Mr. Osmers.

Mr. OSMERS. I want to clear up one point that the gentleman made with reference to French and the English: Do I understand correctly, if each individual has been issued masks, that would protect them?

Dr. GORDON. No, sir.

Mr. OSMERS. You mentioned a degree of protection which they had which the southern European nations did not have. What is the protection they have?

Colonel BAKER. I believe I can give the answer to that, sir. * * *

Mr. OSMERS. Thank you very much. I thought you were referring to the civilian population and that was so at odds with what I had observed there. The other observation, Mr. Chairman, that I would like to make is that at the level of $40 million a year for expenditures here, that is one-thousandth of the defense budget of the United States, and it would seem to me that it would be a very wise investment to the Nation to increase that to three one-thousandths of the defense budget for the tremendous significance that it would have to our future.

Mr. MILLER. Mr. Chairman.

The CHAIRMAN. Well, we have a job to do in helping to get the amount to the proper figure.

Mr. OSMERS. I think we have to say one thing, Mr. Chairman, in fairness to Members of the Congress who have not had this briefing and also to the people that send us here and that is I do not feel that the American people nor the average Member of Congress is aware—certainly I was not until this morning—of the great strides which have been made in chemical warfare.

The CHAIRMAN. Mr. Miller.

Mr. MILLER. I just wanted to say that I think Mr. Riehlman made quite a substantial contribution this morning and I think the tragic part of it all is today, this year, as of 1959, there is less interest being shown in the Congress in the field of civilian defense than there has been since the Korean struggle. It has gone down rather than up.

The CHAIRMAN. It has to be reorganized in my judgment. General, may I ask you one or two questions because we have to adjourn. The House has gone into session. We were accused in the Korean war of using chemical warfare. Did we actually use chemical warfare and you can answer that off the record, if you wish.

General STUBBS. I would like to have it in the record, sir. We did not use biological warfare as we were accused. This was the large accusation, that we did use biological warfare in Korea. We did not use biological warfare in any way, sir.

The CHAIRMAN. Did we use chemical warfare?

General STUBBS. No, sir, we did not use chemical warfare in Korea.

The CHAIRMAN. Do you think the reaction from the Chinese and the Soviets was due to the fact that they were working on that same program?

General STUBBS. It is our belief, sir, that as a result of the information that came to us through that propaganda campaign that they were working at least as hard at biological warfare at that time as we were.

The CHAIRMAN. Do you think that that is still the case?

General STUBBS. I think that that is still the case, sir.

The CHAIRMAN. That we are still lagging behind Russia and the Chinese probably?

General STUBBS. Perhaps, sir, on some aspects of the subject, and assuming that Russia is sharing its information with Communist China. I may say that the information I have received adds up to a total Communist effort in biological warfare greater than ours, although it is difficult to judge how much of it has related public health aspects. We have learned, however, of an extensive field test program and test sites that can only be concerned with offensive employment of such agents.

The CHAIRMAN. Well, I want to thank you very much.

Mr. FULTON. Just hold there. Would you please put in the record a statement substantiating the premises of your belief, not now, but put it in the record?

The CHAIRMAN. Do you mean for publication?

Mr. FULTON. No; I just want to know.

The CHAIRMAN. In executive session?

General STUBBS. You would like to have me get in writing to you——

Mr. FULTON. Yes; your sources.

The CHAIRMAN. Amplify it a little bit.

(The information requested is as follows:)

* * * * * * *

General STUBBS. May I make a comment? The comment has been made that possibly people in the Department of Defense are not as familiar with this problem as they might be. I would like for the record to state that Dr. York at this time is conducting investigations as to whatever additional emphasis should be put on these areas. Of course, General Trudeau has supported the program within his available resources very strongly. That is what has kept us going as strongly as we have.

General Magruder has supported this program strongly.

The CHAIRMAN. Thank you very much, general.

May I say at this time that tomorrow we have a very important hearing, also. Mr. Holaday from the Defense Department will brief the committee on the national defense plan that is, Nike versus Bomarc, and so on, and his office has called to tell me that later on, tomorrow afternoon, he would not be available so we would have to finish tomorrow morning.

As a result of that I have asked two members of the Government Operations Committee to sit in with us. They have replied to that and they will be present unless there is objection.

I want to thank you, General Stubbs, for a very impressive presentation.

General STUBBS. Thank you, sir.

And we would certainly appreciate having you come to Fort Detrick, sir, with the members of your committee to see that installation. We feel restricted here in attempting to present a vast subject in so short a time. If we can take you out to our field establishment where our people are doing this work and they can tell you what they are doing, we feel you can get a really critical look at it.

The CHAIRMAN. That is a fine invitation. We will accept it some day and we will let you know.

The committee is in recess until tomorrow morning at 10 o'clock.

(At 12:06 p.m. the committee was recessed until 10 a.m., Tuesday, June 23, 1959, to consider another subject.)

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